RECOVERY FROM PERSONAL INJURY

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Recovery from Personal Injury

This thesis is aimed at testing some prevalent assumptions about the social and psychological factors which may be related to recovery from a minor or moderate personal injury, such as a sprain or a fracture. Injury recovery has an interesting social and clinical context. Those who are recovering from an injury look perfectly well, except they may be in pain and are physically restricted. Most importantly they are unable to carry out usual activities, which includes work. The concept of *malingering* has both a lay and a clinical meaning, although the distinction between the two can be hazy. In both contexts, it implies that the recovering individual is probably more capable than they portray and that their injury provides an opportunity to avoid work. This concept has become generalised to include a range of psychological dispositions of the injured person thought to be causally related to a delay in recovery, and which may make the person vulnerable to a slow recovery. It is the association of these psychological factors with rate of recovery which is examined in this thesis, rather than a more direct assessment of the incidence of malingering. The basic question posed is whether the rate of return to work after an injury is a matter of volition. The study population are Strathclyde police officers, selected because they are socio-demographically similar, and because the incidence of injury at work and outside of work is high. Three studies were conducted: a cross sectional examination of the affective state of convalescent officers compared with working officers; and two prospective studies which aimed to identify such relevant personal dispositions as affective state and job dissatisfaction. The history of absence from work through ill health was included. The officers' perceptions of blame in the injury incident were included in view of previous research which had found attributions to be a significant determinant of recovery rate. A pivotal issue in the research, assumed to be a simple matter at the outset, was the determination of the relative severity of the injuries. A method applied in previous research was adopted. This depends upon medical practitioners' estimates of likely recovery time for particular injuries, from which a measure of *adjusted recovery rate* is calculated. This exercise yielded a surprising and interesting result: medical practitioners have great difficulty in estimating recovery time. This fact begs the central question of the thesis: what is an appropriate period of recovery against which patients who are delayed in recovery may be compared? Nevertheless, this outcome was used in the regression analyses. The most important predictor of rate of recovery is the *causal attribution* which the person makes about the incident in which they were injured. This replicates previous research, but extends it by providing evidence that attributions of blame (*culpability*) are only relevant in the context of injuries at work. It was concluded that the range of circumstances in which people are injured when not at work is too heterogeneous to allow prediction on this basis; although, nor was there evidence of personal dispositions being influential in the sample of officers injured off duty. Rather than supporting a vulnerability model, as is suggested by the idea of malingering, the findings point towards a sociocognitive model. No theory was tested although a shift in orientation took place, recognising that a vulnerability model is too simplistic.

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Chapter 1: Recovery from Personal Injury: Introduction

Abstract. This Chapter provides an overview of the research area, which is to examine social and psychological predictors of recovery from minor to moderate limb injuries. Lay and medical concepts of malingering are discussed as are other types of psychological explanation for delayed recovery from injury. It is proposed that understanding the bases and nature of these explanations is important. Such attitudes form part of the social context of recovery, and may influence the approach of the lay person, the employer and the medical professional to the recovering individual. Some of the literature background is also presented. Much of this clinical literature is biased towards the unusual case, that is it concerns patients who fail to recover or who are slow to recover. The consequence of these attitudes and of the concentration in the clinical literature means that very little is known about how people normally recover from such injuries. In addition to this social context, an injury is of psychological interest for two reasons, firstly, it is a sudden life event and, secondly, convalescence from an injury requires that an otherwise healthy person remains inactive for a period of time. Design issues of the study are discussed as is the decision to study a socio-demographically homogeneous sample of police officers.

1.1 Introduction. Little is known about psychological aspects of injury recovery, and in particular about recovery from the common everyday injuries which happen to everyone at one time or another. Such injuries account for high levels of morbidity in the general population. To consider the population of police officers studied in this thesis, there are 5286 constables in Strathclyde Force and in 1989, 5532 working days were lost as a result of musculoskeletal injuries (McLay and Mitchell, 1990). Given the high levels of morbidity in the general population and the time and attention required in Accident and Emergency Departments in dealing with them, surprisingly little research has been carried out on the factors which determine recovery time following these injuries. Those few studies which do consider injuries at the lower range of severity are hampered by crude or

inaccurate methods of assessing injury (Woodyard, 1980a; 1980b); or by failing to take injury severity into consideration at all (Goldwyn and Day, 1969; Gardner et al., 1968; Johns, 1981). Brewin et al. (1983) and Allodi and Montgomery (1979), however, conclude that there are psychological and social influences on rate of recovery. The present thesis follows on from this work to find if there are particular vulnerabilities in patients which are generally associated with a longer than expected recovery.

That recovery from an injury is not entirely related to its severity, and is subject to many different individual factors, is the subject of clinical folklore and clinical knowledge. An orthopaedic surgeon writes: 'It is a common clinical observation that patients respond very differently to similar physical problems, and this has led to a search for other factors influencing how patients respond to illness' (Waddell et al., 1984). Further, there is the view that the time taken to recover from injury is partly volitional, due to dispositional factors, and to a degree is within the person's own control. In an informal survey of such attitudes (Mitchell, 1991b), 188 subjects were asked to indicate the degree to which they agreed to a number of statements about injury recovery. Almost 40% believed that 'malingering is quite a problem for employers'; 31% agreed that 'people who get injured are quite often uncooperative with the people who are trying to help them, and quite often don't comply with medical treatment'; and 26% agreed that 'being injured and off work gives people a well earned break from work, like an unexpected holiday'. These are surprisingly high affirmations of the statements, given that no other information is provided about the patients other than that they were 'injured and temporarily can't go to their work' (Appendix A).

A further measure of these attitudes was obtained in a study by Mitchell and Swan (1991). In a study of explanations for delayed recovery, they found first year physiotherapy students (n = 53) with no clinical experience attributed psychological explanations (e.g. lack of motivation, depression) for delayed recovery in a patient with a back injury, but gave more physical explanations (e.g. antibiotics not effective, misdiagnosis) for delayed recovery in a patient with

pneumonia (X^2 = 5.41, p = .05). It is possible that such attitudes would influence the care provided for injured patients.

The word *malingering* entered common speech about two hundred years ago to describe soldiers and sailors who faked illness, or protracted illness to avoid performing duty for their country. In the contemporary setting, the concept of malingering is based on a prevalent perception that people are motivated by a desire to stay off work on 'sick time' in preference to going to work. The psychiatric term for this motivation is 'secondary gain'. The implication is that people will act in a certain way and are motivated to achieve something, for instance, money, a break from work, or sympathy and attention, by acting in an ill way. That which is achieved is secondary to the behaviour of being ill. In psychiatry, it refers to the "intentional production of false or grossly exaggerated physical or psychological symptoms" (DSM-III-R V 65.20) in pursuit of a goal. This might be avoiding undesired situations involving work, danger, or criminal proceedings or gaining desired rewards such as drugs, or financial benefits by means of compensation or litigation (Pankratz and Erickson, 1990). Whether the patient is actually seen as malingering, there is a perception that psychological factors might explain differences in recovery time from similar injuries.

In clinical usage there is some confusion in the term. Diagnosing or seeing a person as a malingerer, may mean simply that the patient's behaviour is not well understood by the clinician. The utility, in understanding a complicated phenomenon such as recovery, of concepts such as malingering needs to be questioned, whether used in the psychiatric sense or in the lay sense. A recently expressed concern by a clinician is pertinent:

'The literature is (in)conclusive; the grounds for concluding that a given patient is malingering is speculative and clinicians will vary widely in their willingness to use the label. It is my belief that the *notion* of malingering is conceptually muddled and that it serves no *positive* diagnostic purpose. If we remove this concept from our clinical vocabulary. I believe we will be better able to assess and treat patients,

and we will better serve those agencies (insurance companies, government agencies and courts) who ask us to make such determinations.' (Pankratz and Erickson, 1990)

There is also a lay use of the word malingering which implies work avoidance, 'taking advantage of the system', and a mix of social and psychological attributes of someone who is unable or unwilling to pull their weight at work. This thesis does not directly examine malingering in the strict psychiatric sense, for instance, by testing whether there are observable 'secondary' goals which the patient wishes to achieve. What it aims to do is find whether there are, in fact, social or psychological influences on recovery time. A simplistic explanation of the patient's motivation based on malingering may not be helpful in an occupational and managerial context. Identification of general and specific reasons for variation in recovery time, on the other hand, or dispelling the misconceptions which may exist can assist employers to recognise individual vulnerability and to plan appropriate interventions. The assumption that psychological factors may be an influence on delayed recovery obtains some support in previous studies (Brewin, et al., 1983; Allodi and Montgomery, 1979). Generally, however, very few studies have been conducted on injury recovery partly because of the logistical difficulties and expense of carrying out prospective studies with injured patients. This thesis hopes to contribute to a more useful understanding of the problem by considering a single occupational group of police officers. The following section examines possible reasons why these attitudes exist.

1.2 Bias in the clinical literature: the tradition of medical clinical experience and the use of case studies. In 1961, Miller wrote an article published in the British Medical Journal entitled *Accident Neurosis*. The thesis of this article was met with approval from the readership, and his explanation of delayed recovery in patients seemed to answer a need in the medical community to view patients as neurotic rather than disabled or in pain. In the intervening thirty years, comments indicating surprising emotion can still be found in quite recent medical literature (Woodyard, 1980a; 1980b). In his study of the 'effects of

litigation and compensation claims on the course and prognosis of injured people', Woodyard warns that slowly recovering patients may be 'welfare scroungers'.

That there is an emotional component in the way that the medical profession write about injury recovery is evident from the use of such phrases. In part this emotional response may derive from general practitioners' and specialists' frustrations in dealing with one particular group of patients, those who complain of back pain or injury. At a very simple level a person with a back injury does not have a visible ailment and can only make manifest the restriction and pain he or she is experiencing by awkward movement and other pain behaviour, e.g. grimacing, looking distraught. That this behaviour can also be manufactured in the absence of pain leads to confusion in the minds of those treating such patients about whether the patient is 'genuine' or not. These frustrations, and the real or imagined problems with back patients may generalise to patients with different types of injuries.

The aim of research in clinical medicine is different than that of psychology. Clinical research is designed to assist diagnosis, description and categorisation of illness and trauma and this falls within the traditional medical model. The intention of psychological research is to predict behaviour, establish causal relationships and describe the interaction of physical, psychological and social factors. This latter approach also lends itself to understanding patient reactions within the many health belief models (for instance, Becker, 1974), and the preventative health model, as distinct from more traditional medical models. The traditional clinical literature is biased towards the unusual case, referring often to interesting case studies of individual patients (see any Lancet, British Medical Journal, or Journal of the Royal Society of Medicine). This tradition has encouraged a focus on the extreme or unusual patient, and in the study of injury recovery it has diverted attention from how people ordinarily recover. The extreme case or the unusual case is, by definition, a small percentage of the total population of people recovering from injury. Literature of this type is interesting but of little value in understanding the general themes.

Most other clinical studies have concentrated on an extremely biased population of patients: those who have failed to recover within proscribed time limits and in the proscribed manner, and this necessarily has biased what is known of injury recovery, and often it is atheoretical and influenced by clinical impression or 'common sense' rather than empirical study. A few examples of this body of work will, however, be reviewed since it has dominated the field of injury recovery. Fairly typical, is a paper written by a psychiatrist and an occupational health physician, Derebery and Tullis (1983). The aim of this paper was to 'consider the role of factors such as secondary gain in the phenomenon of 'delayed recovery'.' The study depends on case studies although there is no information regarding the source of these patients, nor any other information about them. Factors such as the patient's view of the accident, medical history (including hypochondria, exercise, and sexual activity), work history, family history and mental status were considered, as well as the results of a physical examination; which is described as five 'excellent nonorganic physical signs'. The conclusions of the study are the same as the initial premise which is that 'delayed recovery' is an emotional problem, although the secondary gain which the authors suggest is motivating delayed recovery is not empirically substantiated.

The authors provide suggestions for treatment which include early return to work, minimising bed rest, maximising activity, relaxation, and "wearing gym shorts to therapy" ! They suggest that physicians should be suspicious of patients who are slow to recover, and that individuals should be responsible for their own welfare. There is also mention of what they perceive as the 'unhealthy situation in which the patient governs the physician's medical treatment'. This statement is interesting in the context of assumptions about who has responsibility for deciding the date of return to work. General practitioners often perceive that it is up to the patient to decide when to return to work (McLay, *personal communication*); yet it is the frequent perception of patients that it is 'up to the doctor'. This point, and the implications for patient management, is discussed in the Conclusions to the thesis.

In a further study of this type, Florence (1981) an orthopaedic specialist, in a particularly florid work considers the concept of a 'chronic pain syndrome'. This paper is speculative in style, and the propositions are preceded with statements such as 'in my mind' or 'in my experience'. He states that in 80% of his patients, hysteria and hypochondriasis are essential parts of the personality. The population of patients is not described beyond this, nor indeed are the criteria by which hysteria and hypochondriasis can be recognised. Situational depression, as well as hysteria, are considered 'cardinal symptoms' of this syndrome. The paper is quite typical of the unscientific and speculative approaches common in this area. Suspicion is advocated in treating chronic pain, and patients are described as being 'overtly or covertly fraudulent'.

To conclude this section with a study by Woodyard (1980a; 1980b) which examined the influence of a range of factors on recovery time in a series of 584 patients. The factors were age, occupation, the presence or absence of back injuries, the type of treatment offered, compensation neurosis and general motivation. This study will be described only in terms of the rating of injury severity, the imprecision of which render the findings very questionable. The injuries were classified into three groups: 'trivial' (e.g. concussion with amnesia for less than one hour, low back strain, or sprained ankle) which 'require no more than one month off work'; 'minor' injuries (e.g. fractures and dislocations, or more serious head injuries), for which up to three months 'seemed reasonable for the average person in the average job'; and 'major' injuries (long bone fractures, or severe hand injuries), no time estimate is provided for this classification.

These classifications are quite arbitrary and no rationale is provided as to why one month or three months seems a reasonable absence, nor how the average person in an average job might be defined. The judgements of injury severity were made solely by the researcher leaving it open to question whether they may have been biased. In the conclusions to the study, the declarative statement is made that 26 people with trivial injuries 'had' compensation neurosis, a term which is used synonymously with 'accident neurosis syndrome', and with no reference to

DSMII-R definitions. The further statement, 'the importance of inadequate motivation is difficult to estimate accurately, though I suspect that it is great', also throws into question the results of this large, and likely time consuming study. Woodyard shares the sentiment with his readers that 'we already find that the whole ethos of the welfare state is simply not conducive to early return to work . . . (and advocates comparing compensation cases with others) . . . to encourage a more healthy and dignified attitude to injury on the part of the general public'.

Miller's work (1961) continues to influence attitudes and attributions in practice and by extrapolation, the way that patients are treated. Similarly the work cited above insinuates care and treatment and can have an effect on practice. In the present author's experience, Florence's paper was used in training courses for rehabilitation consultants and claims adjudicators at the Workers' Compensation Board in British Columbia, and it is used as a reference in Provincial Government publications.

1.3 An attitude of 'hard boiled' common sense. The theme which runs through these works reflects an attitude in clinical judgement of what could be called 'hard boiled' common sense. Clinical judgement has, however, been demonstrated (Eiser and van der Pligt, 1988) to be subject to the same cognitive biases and heuristics to which most other social judgements are subject, for example, salience and non-normative judgements; and there is a tendency and preference in doctors to use heuristic models in predicting and diagnosing instead of normative strategies (Mitchell, 1991b; Eiser and van der Pligt, 1988; Dawes, 1982). These may be based substantially on common sense.

By way of analogy, Worral (1990), in a different context, describes common sense as being the 'metaphor for those statements which tend to be excluded by experts'. Common sense is defined as those 'crude, unrefined and challenging statements which are unanswerable within expert discourse'. She provides the example of a magistrate taking psychiatrists' reports "with a pinch of salt". In the present context one is presented with the peculiar situation in which

there is a heady mixture of both common sense and selective attention to certain salient features of the patient. It is common sense in its rejection of expert information, such as normative data from empirical studies. Clinical opinion may not benefit or become changed by normative data from the doctor's own experience with his or her patient population since feedback on outcomes is not consistent (Eiser and van der Pligt, 1988). Selective attention can be paid to psychological or social features of the patient about which only a psychologist or psychiatrist could render an informed and expert opinion.

The process may be to reject expert opinion or empirical evidence because it may not accord with a priori common sense, for example, that most people would rather stay away from work than be at work, and to supplant expert opinion by the doctor's *own* expert opinion which is based on clinical experience. The similarity between lay and medical perceptions of recovery (Section 1.1) suggests that a doctor brings commonplace lay opinions to his or her clinical experience. The only evidence available at this point is from a far from scientific study of these attitudes by the author. In this doctors were asked to generate possible reasons for delayed recovery in an injured patient, no other information was provided other than that the recovery was slower 'than expected'. Nine family practitioners were surveyed and presented with the following, "You will have treated many patients with fractures of various types. I would like you to imagine a patient who is, in your estimation, taking longer than you expected to recover from the injury. Please think of possible reasons why such a patient may not be recovering as quickly as they should, i.e. think of the sorts of explanations which might go through your mind when faced with a patient like this".

Explanations which were provided included such statements as 'the patient is unhappy with his lot'; 'has a poor outlook on life', 'is depressed', 'is unhappy'. Other explanations would be that the patient is an 'anxious type', is 'too worried about himself' or is 'neurotic'. Often job dissatisfaction was cited as a reason and, without fail, the seeking of compensation was suggested as a major motivator.

Four basic categories emerged: the patient is dissatisfied with the job and wishes to avoid it; is seeking financial compensation; is depressed or unhappy; and is anxious or neurotic. Other clinical explanations were also provided, such as an ill-fitting plaster or wound sepsis, but there was a common thread of psychological explanation which every doctor offered. It is, however, not suggested that this was a correctly conducted survey.

In a recent article (Engel, March 1991), 'heartsink' patients are discussed; 'heartsink' apparently denotes those patients who make the doctor's heart sink when they come in to the surgery, a term borrowed from another writer (O'Dowd, 1988, describing 'Five Years of Heartsink'). A table is presented in Engel's paper which classifies such patients as those with 'psychoneurosis' or 'somatisation disorder' with crosses to indicate that a certain psychological or psychiatric feature is always, sometimes or never present. The source of this classification is not provided, for instance, whether it is based on other sources, or the writer's own opinion or a survey of colleagues. So, in clinical contexts it is not assured that a medical practitioner can offer a truly expert, in the sense of an informed, objective and unbiased opinion on such matters of the patient's psychological state, or even motivation or cognition. In other words the expert practitioners are adopting common sense attitudes and biases, and acting on them in professional practice and, in the instance cited above, using the vocabulary of a quite different specialty to describe such attitudes. Given these biases, and with the weight of clinical experience to support opinion, one can easily imagine a physician passing a judgement on a patient's personality (motivation, character) and modifying treatment based on this judgement. Conversely, it would be considered inappropriate for a psychologist to pass judgement on a ligamentous strain of the knee. This is an inherent oddity of the two disciplines of psychology and medicine, and why it is important to make manifest the bases for clinical decisions and attitudes to ensure that they are not just good common sense.

Worral (1990) goes on to describe the main goal of common sense as being to achieve consensus, by substantiating an implicit assumption in groups that there

is mutual agreement. This is sometimes the impression one gets from reading clinical case studies. The writers, by providing instances in which particular patient characteristics are evident, can confirm and seek agreement among the medical community that these characteristics are common and typical of patients, and that in the present context they are associated with delayed recovery.

Some medical literature advocates treating patients with suspicion (see Section 1.2). One can see how such a perception of patients could infiltrate practice and eventually be seen as quite a sensible approach in dealing with a patient who is not resolving clinically. Reference by the practitioners to their clinical literature reveals the extreme case study, thereby reinforcing the salience of the unusual or extreme cases. The application of lay theories of psychology or personality does not usually have fatal consequences and so is relatively harmless, although treatment could be delayed or the doctor may convey an off hand attitude towards the patient. True harm could result if the treatment is essential; or if the patient feels frustration that his or her condition is not being taken seriously. In the back pain literature this invalidating of the patient's pain experience can result in more and more intense efforts on the part of the patient to be believed, and a consequent entrenchment of illness behaviour (Waddell et al., 1984).

1.4 Why is an injury of psychological interest? An accident in which one is injured is a threatening life event, in the sense of Brown and Harris (1978) and an injury has a significant impact on social and occupational aspects of the person's life. It is the interest of this thesis to find whether there are social or psychological influences on the course of recovery from injury. The suddenness of the change in the person's status from being able bodied to incapacitated allows characteristics of the patient to be measured soon after the injury has happened. This is unlike illness which, generally speaking, has a more gradual and insidious onset.

Convalescence from injury also differs from convalescence from illness: the

injured patient usually feels perfectly 'well' in the sense that he or she does not usually feel sick, or suffer loss of appetite or experience a headache which an 'ill' person might. To be injured, even in a minor way, is restricting and those who have experienced minor or moderate injuries are often surprised by the degree to which they are rendered incapable and dependent on others for simple activities of daily living. Despite this physical restriction they feel well, and may feel frustrated at the period of enforced inactivity. In this regard, convalescence may share some of the psychologically distressing characteristics experienced by the unemployed (Warr and Jackson, 1985).

1.5 Selecting a sample for study. The aim of the present thesis was to consider what psychological factors might influence the course of recovery and, as such, demographic variables, for instance age, or social variables, for instance socio-economic status were of less interest. At the outset it was thought that patients attending an orthopaedic outpatient clinic would be ideal. A pilot study carried out at the Accident and Emergency Department of the Victoria Infirmary, Glasgow made it obvious that there were very many practical and other considerations which lay in the way of using this population. Among other problems, the time pressure on the consultants, registrars and doctors working at the department simply does not allow for the type of standard medical examination which is necessary for research.

In planning the study it was thought important to assess the severity of the injury immediately after or very soon after it had occurred, which is why the Accident and Emergency Department was used. The thinking behind this was that only at this early stage could the injuries sustained by the sample be properly compared without the mediating influence of the passage of time. It was, however, simply not practical to do this partly because of the impossibility of the researcher's being at the clinic continuously in anticipation of the arrival of an injured person. In addition, the patients in the Accident and Emergency Department were often not enthusiastic about being interviewed either before they had treatment or immediately after since their concerns were focussed on their injury. Also, a number of those

injured and awaiting treatment were drunk.

The plan to assess immediately after injury was abandoned, but there is a good clinical reason for delaying the initial clinical examination, as follows. The period of about ten days after injury is a time of clinical flux, during which time the condition may complicate. Sepsis may become apparent during this time, problems may result from the misapplication of a plaster, or an injury first diagnosed as a sprain may turn out to be a fracture. Consideration of these clinical factors rendered the time period immediately after injury the less opportune for examination. Ten to fourteen days after was considered a more suitable time for assessment.

In order to look at social and psychological factors during recovery not only must there be a method of comparing the injuries relative to each other, but also the demographic and other characteristics of the sample should be as similar as possible. In view of this, the suitability for research purposes of the obviously broad range of people who attend an Accident and Emergency Department was questionable.

It had been decided early on in the study to use the time taken to return to work as the main measure of outcome. This obviously required a sample of people who were steadily employed, and, ideally, in jobs which are similar ergonomically. Of the greatest importance is that the subjects should all have the same conditions of employment as regards sickness absence. In the Accident and Emergency population almost half of those attending the clinic were unemployed. To reduce the massive effect of more obvious and possibly less interesting variables, such as age, the subjects should be of a similar age band. Those attending hospital clinics range from paediatric to geriatric patients. All of these considerations would not have been satisfied by a hospital population, but could be in a sample obtained from a single employer through the employer's occupational health unit. British Rail were approached and were pleased to participate, but again the potential sample was

restricted: the number of people in jobs which were physically sufficiently similar, and who could possibly sustain injury was greatly limited. The Chief Medical Officer at Strathclyde Police was approached, became interested in the project and was able to provide a population for study.

Police officers in Strathclyde Police, comprise a population which meet all the criteria mentioned above. Over 90% of the officers in Strathclyde Police are active constables or sergeants, which satisfies the requirement that the physical work performed by the subjects is much the same; at least they are more similar than they are dissimilar. In addition, they sustain minor to moderate injuries with relative frequency, not only in the line of duty, but also in sporting and home maintenance activities. Among other factors, this frequency of injury is probably attributable to their age group: the average age of the subjects in this study is just over 33 years. Very importantly, the employee benefits are the same for each individual in the sample. In collecting data, the level of literacy within the police is such that none of the instruments would pose any difficulty for them and this was not the case when piloting some of the instruments with the hospital population.

1.6 Conceptual and theoretical issues in the design of the research.

The thesis approaches the question of psychological factors in injury recovery from a mixture of a medical model, considering patient vulnerabilities, and a socio-cognitive theoretical position (Oatley and Bolton, 1985), and from the tradition of life events research, including the social aetiology of depression (Brown and Harris, 1978). It also derives from the prospective investigation of the effects of redundancy (Warr and Jackson, 1985; Bolton and Oatley, 1987).

The problems of separating out the causal issues or the particular stimuli which produce individual variation are also a component in studies of unemployment, or other life events. The theoretical question is whether it is the *event* of job loss which is associated with depression or the *experience* of unemployment which produces depression? Separating out causal issues is no less complicated in the present study where there is no opportunity to obtain pre-morbid

measures.

There are two, or possibly three models which could guide research. The model suggested by the lay and medical perceptions of convalescence is that the person had a pre-existing vulnerability, such as a characteristic, like idleness; or a pre-existing motivation like greed for financial compensation. These particular characteristics of the patient would pre-date the injury and would make him or her vulnerable to a poor reaction to injury. By this model, the injury or potentially any other life event, will bring to the fore problems which were previously hidden.

By contrast, the second model, a reaction model, proposes that the patient was perfectly all right before the injury. It is simply the trauma of being injured which produces a poor reaction; and it may be safe to say within this model that the reaction to an injury, whether in the short or longer term, may be contingent upon the severity of the injury. Other factors which might explain variation in reaction to being injured and, by extrapolation, variation in length of recovery might be akin to a post-traumatic reaction. A variation of the reaction model would suggest that delayed recovery is simply the consequence of the convalescence itself, including the emotional correlates of the inactivity and change of circumstances brought about by the convalescence.

Compromises in design were required. In the prospective studies, patient characteristics were measured as early as possible in the convalescence, which could test the vulnerability model to an extent. Since the measures are taken after the injury, the reaction to the injury itself would be separated out, for example, by asking about attributions to it. Measuring factors during convalescence in this way is the closest one can get to a pre-morbid measure.

There are several outcomes which may be of interest; in the present study a behavioural measure, the date of return to work, is the main outcome or dependent measure. This may not be as good in some aspects as obtaining an anatomical or

clinical measure at some specified time at follow up, but it does have several very practical advantages. These issues are discussed in detail in Chapter 6, but one of the most salient problems is that if an anatomical or clinical measure is chosen, when would be an appropriate time to take this measure? In a somewhat circular way, this is a decision which can only be made post hoc, after the person has returned to work.

Affective state is another outcome of interest. But the question is, when is it of *most* interest? At the end of a convalescence, some of which are only two weeks long, and others which are six months in duration? Or in the middle of the convalescence or even at the outset immediately after the injury? In this thesis affective state is the main outcome measure in the cross sectional study. Other questions arise when considering affective state: Do the factors which predict length of recovery also predict affective outcome? Which comes first, does affective state influence the length of recovery or the length of recovery influence affective state? Other studies have looked at subsequent affective state, or more correctly, psychiatric state in more severely injured populations (Malt et al. 1987). Many of these questions are beyond the scope of the current studies.

In summary, a problem in studying this phenomenon is the degree of variation in practically each element. This makes measurement, comparability and the logistics very difficult. The participants in the study were all injured at different times, to different degrees of severity, at different anatomical sites, under different circumstances and they were off work for different lengths of time. The empirical element of this thesis embraces all these sources of variation to separate out the causal issues in order to establish which model best explains the data, and this necessarily requires the collection of many variables.

1.7 The plan of the thesis. Chapter Two reviews the literature on injury recovery, making the point that the topic spans both psychology and medicine. In this review, there is an attempt to reconcile the sometimes conflicting perspectives of these two disciplines. Chapter Three is a description of the working life of

Strathclyde Police officers and of the sorts of circumstances in which they become injured. It describes some of the threatening and dangerous situations under which they work, as well as the different sources of stress on the job and it includes a short review of the burgeoning 'police stress' literature.

Chapter Four describes the psychological and social measures used in the cross sectional study and the two prospective studies. The reason for their inclusion in a separate chapter is that several variables were common to both studies, such as the standard self report measures of affective state. Some variables, such as job satisfaction and social support, are common to all studies, although the precise way in which they are measured is different. Some other measures are unique to particular studies.

Three empirical studies were carried out. Chapter Five describes the cross sectional study and this element of the thesis yielded interesting results to do with the psychological state of officers during convalescence, compared with others who were are at work. Chapter Seven describes the first prospective study which examined possible predictors of rate of recovery, and in which a questionnaire was used to collect data. Chapter Nine describes the second prospective study of predictive factors, in which a semi-structured interview was used to collect data.

At the outset, the assessment of injury severity by a medically trained person was thought to be a simple matter, and that many methods for making assessments would exist. Physicians are frequently asked by their patients, by courts and by employers how long a person is going to be off work after an injury, and it was an assumption that this would be a relatively simple task. It is not so simple, and Chapter Six describes the difficulties associated with grading the severity of injuries, particularly at the clinically less severe level.

Chapter Eight discusses the impact which the Lockerbie Air Disaster has had on the Force, and is included in this thesis for several reasons. The Lockerbie

Disaster happened while the injury study was being carried out (21st December 1988) and as a consequence the assessment of subjects had to cease for a short time in January and February 1989. The possible effects of duty at Lockerbie are included in the analysis in the second prospective study, in terms of the effect on length of absence. For many officers, duty at Lockerbie was a significant and threatening life event, although the overall effects of a large scale event of this sort are hard to capture statistically there was an observable impact on the health and welfare of the force.

The discussion and conclusion in Chapter Ten co-ordinate the findings from all three injury studies, as well as from the Lockerbie study as it is relevant. The results are discussed within the context of theoretical interpretations and in reference to the previous literature on the subject. The practical implications of the results of the thesis for preventative health and operational planning strategies are discussed. An Appendix contains additional information, the instruments and details of the data analysis. Included in the Appendix are anatomical drawings to assist understanding the site and type of the injuries.

Chapter 2: The Review of the Literature.

Abstract. There exist very few studies of social or psychological predictors of recovery from injury. This review is separated into five areas. The first indicates the areas of previous research which are related but not directly to the topic of the thesis. The second reviews studies which have tried to relate initial injury severity to various outcomes, without considering psychological factors. The third reviews studies of variable quality which consider social and psychological factors in injury recovery, and a fourth reviews two studies which approach the topic from cognitive theory. There are no known studies of the experience of convalescing from minor to moderate injuries, and so parallels are drawn in a fifth section between the experience of unemployment and that of convalescence. There are many other factors to be considered. Research approaches need to strike a balance between recognising the significance of broad demographic and social influences on recovery time, and recognising the importance of individual cognitive factors.

2.1 Introduction. The main impetus for carrying out the present research was the author's own experience at the Workers' Compensation Board of British Columbia in Canada. This is a very large Provincial Government organisation the purpose of which is to dispense compensation to victims of industrial accidents. Part of that process is to monitor, and in some cases provide, treatment for the injuries, and to provide rehabilitation services aimed at returning the worker to their previous employment. The author's employment with the Board as a 'rehabilitation consultant' informed that, typically, attention is paid to those recovering from injury only when they become a 'problem case' in terms of managing the claim. A problem case could represent an individual who does not recover at all, one who recovers slowly, one who begins to manifest psychological symptoms (with no knowledge on the part of the organisation whether these are pre-morbid symptoms) or one who, for a variety of reasons, cannot return to their previous employment. A case, typically, was not referred for rehabilitation until they had been absent from work for over three months. It was conceivable that earlier intervention could have

been helpful. By the time referral was made many psychological, social and occupational difficulties had become entrenched. At that time, a review of the available literature made it clear that there existed very few good empirical investigations of patient factors which would pre-dispose to a poor or a positive recovery. More recent reviews of the literature have yielded very little more in the way of pertinent research.

This Chapter will review the research context attempting to reconcile the real difference in orientation which exists between the aims and interests of clinical medicine and that of socio-psychological research. Daily, medical professionals have to deal with and manage patient behaviour and it appears that this brings with it biases about and frustrations with the failure of patients to respond to treatment. Psychological research, on the other hand can possibly cast a more dispassionate eye on the subject and can aim to aid understanding of the processes that are involved in more 'normal' recovery, rather than only those factors associated with 'abnormal' recovery.

2.2 Areas of research which are peripherally related to the central theme of recovery from injury. There are several areas of the sociological, medical, medico-legal and psychological literature which bear tangentially on the current topic of recovery from personal injury. After considering the various contexts, particular areas were settled upon as being directly relevant (Sections 2.3 to 2.7), and others less so. The latter are discussed in this section.

One area in which there is a substantial literature is on back injury. This is not surprising given that absence due to back injury and back pain is a major concern for industry. In the United States (and one might expect in this country also) it is the most expensive health care problem of the 20 to 50 year age group (Kelsey et al. 1978). Back injury is invisible in terms of the conventional signs of incapacity such as crutches, a plaster cast or a bandage, and as such is often perplexing for those rendering treatment. The thrust of the back injury literature is aimed at distinguishing 'genuine' back disability from other types of disability.

This has led to a healthy research interest in, and the development of, clinical techniques to measure the parameters of true orthopaedic damage as distinct from the other behaviours which may accompany it (Waddell et al., 1982; 1984; 1986). The decision in this thesis to study limb injuries was to avoid some of the difficulties associated with estimating severity of back injury which often requires radiological evidence, and to avoid the problems of dating the onset of such conditions. Most of the research is cross sectional considering the correlates of chronic conditions which is not relevant for looking at early predictors of recovery rate.

In the context of back injured patients,a study (Beals and Hickman, 1972) compared groups of industrially injured patients with limb injuries and with back injuries. This study has many problems associated with non-specifity in terms of the measures used, but is interesting in that the limb injured patients were significantly different from those with back injuries on the Minnesota Multiphasic Personality Inventory (MMPI). The so-called neurotic triad was evident in the back injured patients but not in the limb injured patients. These differences were evident both at the beginning of the convalescence and in follow-up: a further measure of 'total adjustment' indicated that the back injured were significantly more disturbed emotionally than extremity injured. This gives some indication that these two patient groups present quite different problems for clinical practice and for research.

Also, it is worth mentioning that the issue of individual propensity for injury, often called 'accident proneness' (Connolly, 1981) is an entirely different matter for research but emerges in any discussion of injuries. Reviews of this subject have been made elsewhere and will not be repeated here (Engel, 1991; Kune, 1985). The empirical work in this thesis was not aimed at comparing the history or characteristics of those who had accidents with those who did not. This is more the area of the epidemiology of incidents rather than predictors of recovery.

2.3 Studies of the relationship between initial injury severity and subsequent disability. Injury severity rating scales were developed in the United States to allow comparison between patients with anatomically different injuries. These scales have been reviewed several times, most recently by MacKenzie (1984). A method was required to assess the severity of injuries to study the financial and other implications of road traffic accidents, which showed a large increase in the United States in the 1960s and 1970s. The basis of such scales is the degree to which the injury constitutes a threat to life. Although initially developed to categorise initial injury severity, researchers became interested in how well they could be externally validated with a variety of outcomes. The most commonly applied of these scales are the Abbreviated Injury Scale (AIS) and the Injury Severity Score (ISS).

Their relevance to the present research is that it came as something of a surprise to clinicians and epidemiologists that the outcome of injuries judged to be equally severe did not have the same consequences in terms of length of hospital stay, cost or eventual disability. Bull (1975) retrospectively studied hospital records of 1333 patients who had been injured in road traffic accidents and compared their injury severity ratings with several outcomes one year later. The results showed that there was a strong relationship between initial injury severity and subsequent disability, but this was not perfect. Patients with 'very severe' or 'severe' subsequent disabilities had significantly higher injury severity scores than those in all three less severe categories. There were, however, anomalous groups of patients: those with high initial severity and little subsequent disability and those with low initial severity and substantial disability in follow up. Bull concluded that while injury severity scores may be a useful measure of likely subsequent disability when applied to groups of cases they should be used with caution when forecasting the outcome of an individual patient; that is the injury severity score of a single case has little prognostic value. In groups of patients the injury severity rating made gross discriminations between very severe injuries and all others but was largely incapable of making more subtle distinctions. From the conclusion it was not clear whether the writer believed that the observed variation in outcome was the

consequence of deficiencies or inaccuracy in the injury severity rating, or whether it was thought to be due to individual physiological, social or possibly psychological variation.

A more recent study at the Road Transport Research Laboratory by Galasko et al. (1986) aimed to examine the correlation between initial injury severity and subsequent disability six months after discharge from hospital. This was a similar investigation to that by Bull (1975) but the study was carried out in a prospective and longitudinal way. Initial severity was measured according to the AIS and the ISS, and subsequent disability was a measure of the patient's ability to cope with their occupation and normal daily activities. Almost a quarter (23.6%) of those who completed a follow up questionnaire at six months (n = 940) classified themselves as having at least a minor disability; older people and those injured as pedestrians were more likely to report disability.

Of those who reported longer term disability, as many as 50% had the lowest AIS/ISS scores. Conversely 45% of individuals with higher AIS/ISS scores reported no disability. Of direct relevance to the present study, no figures were reported which related the original AIS and ISS to time off work. Although, not surprisingly time off work was significantly (p <.001) positively correlated with reported disability six months after the injury. They conclude:

'the Abbreviated Injury Scale (AIS) and its improved version, the Injury Severity Score (ISS) were of little value in predicting the development of a long-term disability. In particular the ISS was deficient at discriminating between disabling and non-disabling injuries'.

This suggests that there are many factors which may intervene between the original severity of the injury and the outcome. The researchers summarise their findings that 25% of their study sample who were disabled six months later had disabilities uncorrelated with the severity of their initial injuries. Indeed they go as far as to say that '12% of all patients with a disability had no physical restriction,

but had a problem which affected their ability to cope, probably but not necessarily, of a psychological nature'. No psychological or social factors were measured in this study, but the discrepancy between the original injury and subsequent disability is attributed to psychological factors. The study is interesting in that initial injury severity related broadly but not specifically to subsequent disability nor, by extrapolation, to other behavioural measures of disability, such as return to work.

In the United States, MacKenzie et al. (1986; 1988) observed that 'return to work following illness or injury is possibly influenced not only by physical and emotional well being, but also by a number of other non-health related factors, including social factors'. In this study there is an implicit assumption that 'emotional well-being' is influential although it is not measured. The subjects in their study were 479 moderately to seriously injured hospital in-patients. They were socio-demographically heterogeneous and the aim of the study was to develop correlates of return to work: the age range of the sample was 16 to 45, and nearly eighty per cent (78.4%) were male.

Injury severity (AIS) was noted at discharge as were measures to do with their functional status to reflect self care, mobility, and physical capabilities. The subjects were contacted by telephone at six and at twelve months, at which time they were interviewed about their functional status and whether they had resumed work or other usual activity. The time between discharge and the date of their return to work was noted and correlated with sociodemographic characteristics, level of education, job type, income and social support network.

At six months 262 (55%) of the original sample who had worked full time prior to accident had resumed employment. At one year, only 17% of the sample were unable to work; the reasons provided for their continuing convalescence being restrictions in mobility and persistent pain on movement which the patients found functionally debilitating. At one year over half (57%) had no limitations in any area. The remaining 43% reported being less independent or restricted physically as compared with before the accident, and almost thirty per cent (28%) of those with

limb injuries were greatly limited in mobility or physical activity; the greatest proportion of these had severe spine (79%) and head (38%) injuries. Overall the rate of return to work was very strongly a function of the severity of the injury as follows: 75% of the minor, 43% of the moderate, and 11% of the severe injuries had returned to work at one year. As was found in the studies by Bull (1975) and by Galasko (1986), 22% of those who had reported no limitation at discharge were not working at one year, or were only working part time. A strong interaction with age was found: for a given level of injury severity, severe disability increases in likelihood with age. Particular demographic factors were associated with return to work one year after injury: positive correlations (p <.01) were found with education level, having white collar rather than blue collar employment, and level of income before injury. An interesting significant positive correlation was found between rate of return to work and the acknowledged presence or one or more confidants.

Stepwise multiple regression analysis of all the possible predictor variables was applied to an outcome of length of absence from work. After controlling for functional status at discharge (accounting for 16% of the variance) only income prior to the injury significantly predicted rate of return to work. It is interesting that income level was found to be such an important predictor. It may be that this is associated with a range of other factors which would be relevant to rate of recovery, such as having access to superior medical care. It is possible that the social (familial and occupational) expectations of those in more responsible and hence better paid positions would encourage a quicker return to work.

Goldwyn and Day (1969) examined the correlates of recovery in a large sample of hand injured patients (n = 500), 71% of whom were male (mean age 34 years). The severity of the injuries were judged by the clinicians although no standardised method was applied. Interviews were conducted soon after admission with a 70 item interview, detailing hand dominance, work experience, and social and economic characteristics of the patient. 'Psychological attributes' were

measured, although what they are is not specified. Most injuries were lacerations. Nearly three quarters (74%) returned to work immediately, and less than 3% were absent for more than a month; 90% returned within 1 week. Four percent still experienced some effects one year later, and were identified as having been more severely injured because of severed tendons, fractures or amputations.

The researchers conclude, 'the psychological assessment of these patients, albeit superficial, disclosed no association between personality attributes and . . . . . the time off work', which absence they state was principally related to the severity of the injury. The lack of influence from psychological variables is explained by the sample having a 'high motivation to return to work'. It is hard to evaluate this study since the data tend to be descriptive rather than inferential, and many of the items included in the interview are not specified. Most importantly, in the comparative analyses, the influence of injury severity was not controlled for and would tend to swamp the influence of social and psychological variables. The difficulties encountered in assessing injury severity in this low range is evident, and the outcome variable adopted was simple length of absence from work.

2.4 Studies which examine the influence of social and psychological variables on recovery time. In contrast to the above which used large samples to calibrate some influence from demographic and some other variables (for example, social support in the study by MacKenzie et al. 1986, and 'psychological attributes' in the study by Goldwyn and Day (1969) the following research considers sources of psychological variation in rather smaller samples. An important criterion for judging the value of this research is the degree to which injury severity is taken into consideration.

Allodi and Montgomery (1979) studied 255 workers who had been injured during a three month period at two places of employment, a car factory and a department store. Their aim was to test any association between a range of psycho-social factors, such as life events and job satisfaction, and time taken to return to work. In contrast to the above study by Goldwyn and Day (1969) which used the

simple number of days off work as the outcome, a 'rate of recovery' was calculated which took into consideration the severity of the injury. The company doctors from each place of employment estimated a 'fair reasonable and expected number of days off work for that injury'; the actual number of days off were divided by this estimate. This produced a 'recovery rate', considering injury severity, rather than only the number of days off.

A seventy three item self report questionnaire was completed within a few days of the injury. This included demographic information, the General Health Questionnaire (30 item version), six questions on sleep, seven on shift work, a 'psychosomatic symptom checklist', a question on the use of painkillers, and the Holmes and Rahe Social Readjustment Rating Scale (1967) to assess the number of threatening life events experienced in the previous 12 months. Job satisfaction was measured using two analogue scales, rating their present job as the 'worst possible' to the 'ideal'. 'Physical and psychological' characteristics of the injury and the circumstances of accident were also assessed. A follow up postal questionnaire was returned by 72% of the respondents.

Considering the large amount of data collected it is surprising that the only correlation with recovery rate that was reported was that with job dissatisfaction (r =.15, p = .05). It is not known whether a regression analysis was carried out or whether only simple correlations were calculated. The researchers report their other findings thus:

'no significant relationships were found between the occurrence of accidents at work and symptoms of mental health and life stress scores, or between psychological disability following the accident, as measured by symptoms of mental health and poor recovery, and the pre-accident history of medical surgical episodes and accidents or life stress scores before or after the accident.'

In other words it appears that all other factors, other than job dissatisfaction, can be discounted as predictors of recovery rate. Nevertheless, despite the slim

findings, the researchers conclude as follows:

'Job dissatisfaction . . . . . appeared to be related to the probabilities of losing an excess of time following an accident and developing a "neurotic" complication. The results also suggest that job dissatisfaction determines the psychosocial response a person may have to an injury. Similar response to physical impairment of a minor or trivial nature, i.e. common cold symptoms, has been reported under the general construct of "illness behaviour" and it would provide the most probable explanation for our findings. Medical disability or "illness" and consequent absence from work after a minor accidental injury would represent a protective mechanism to avoid a distressing job environment'.

The proposed relationship between job dissatisfaction and psycho-pathological states is based, presumably, on the correlation found between job dissatisfaction (measured in the first questionnaire) and the GHQ-30 ($r = .25$, $p = .01$) measured in the follow up questionnaire. It is arguable whether such a connection would suggest the formation of psycho-pathological states, especially when psychological distress is the consequence of a large variety of different factors.

It may be that the lack of precision in measuring injury severity obscured some relationships. The two company doctors gave consideration to type of job, severity of injury, "etc"; and it is hard to know what else was taken into consideration in making the estimates. In addition, since the injured workers were obtained from two different places of employment, two different doctors would have provided the estimates. No information is given about the internal validity of these estimates or whether any measure of inter-rater reliability was carried out. Quite possibly the use of less precise measures such as the Holmes and Rahe Social Re-adjustment scale, may also have presented problems in inference. A far better picture of the interaction of all these variables with each other and in combination with the outcome would have been obtained by a multivariate analysis.

A study by Johns (1981) aimed to identify determinants of time off work following hand injury in 182 patients. The study considered the relationship of the

nature of the injuries, their treatment, the subsequent complications, type of job, and the effect of pursuing a claim for compensation on the time taken to recover. Over half the subjects were manual workers (55%), 21% were clerical and professional workers, 15% were school children, and 9% were in an 'other' occupational category. Forty two percent of the accidents occurred at work, 36% in 'public places', and 22% happened at home. Subjects were identified and selected through hospital records. Data were collected from that source and by personal interview regarding the nature and duration of treatment, persisting deficits at the time of the interview (measured precisely by power grip, precision grip, sensation, finger mobility, and wrist mobility), whether there had been a claim for compensation, and the length of absence from work.

The initial injuries were classified as 'trivial', 'moderate' and 'severe'. No inter-rater reliability is provided to assure that the injuries would have been placed into the same categories by other clinicians. It is also not clear whether the classification was carried out before or after the interviews, or the exact nature of the information upon which the classifications were based. Nevertheless the groupings have face validity in terms of clinical complication.

The severity of the injury was found to be related to time off work. In 13 cases the initial treatment was inappropriate although this was judged to have delayed return to work in only three cases (how this judgement was made was not specified). Patients with repeated surgery were also slower to return to work although this would have reflected the severity of the injury and subsequent complications, as well as having to wait for hospital appointments. The severity of injury was also related to the subsequent measure of persisting functional deficit. Manual workers had the most severe injuries and were absent from work for a mean of 8 weeks while subjects in the other groups were off for a mean of one week. When comparing manual workers with similarly severe injuries, the length of absence of those who claimed compensation was longer than those not claiming ($p < .025$).

The same difficulties as were encountered in the study by Goldwyn and Day (1969) are found in this one, in that the outcome is not adjusted for injury severity, although the injuries are categorised in groups of similar severity. There is a conceptual confounding of the severity of the injury with the claiming of compensation: it is only the more severe injuries which are eligible for compensation and it is unlikely that they are independent for the purposes of analysis. Nevertheless, Johns concludes that time off work is determined by three factors, the nature and severity of the injury, the pursuit of compensation claims and the physical demands of the patient's work. Most of the statistics, however, are descriptive and it would have been more interesting to know through regression analysis the relative contribution of all three factors as well as other demographic variables such as age.

2.5 Studies of injury recovery which are based on a more cognitive approach. A different approach to understanding recovery from injury is found in two studies based on cognitive theory (Brewin et al, 1983; Brewin, 1984; and Bulman and Wortman, 1977). Both propose that the accident victim's causal explanation about the accident, in terms of internal or external causation, influences the ability of the person to cope with the injury and its consequences.

Bulman and Wortman (1977) conducted a cross sectional study on 29 victims of serious accidents which had rendered them paraplegic or quadriplegic (mean age 23 years, range 16 to 35). In an interview the subject was asked about perceptions of blame and whether the incident could have been avoided. A measure of coping was derived from a composite of a rating by the patient's social workers, and one by a nurse very familiar with the patient of the degree of acceptance of and adjustment to the injury by the patient.

Blaming oneself was correlated with perceiving the accident as avoidable, not being a religious person, and being alone at the time of the accident; attributions of blame bore little relation to actual or objective blameworthiness. The more the

patient blamed another person and the more he or she saw it as avoidable, the less they were seen by the nurse and the social worker as coping. Bulman and Wortman's study, although it is quoted frequently in the literature is essentially exploratory and raises many interesting questions, although the conclusions are hampered by the imprecision of the outcome measure of coping. The researchers conclude that the ". . . ability to perceive an orderly relationship between one's behaviors and one's outcomes is important for effective coping", people need to render their situation and events meaningful. Since the study is cross sectional, whether particular attributions are the cause or the consequence of coping cannot be ascertained. It was interesting that the elapsed time since the accident increased the blame on external factors and lessened the tendency to take responsibility for it; possibly this was because as the consequences of the incident became more obvious, harsh and immutable, the less tendency there would be to blame oneself. Due to the permanent nature of the consequences of the injury, rate of recovery back to normal function was not a possible outcome for the research. The subjects in this study were very severely and permanently injured patients, and the applicability of these findings to the investigation in this thesis is limited.

In a test of the influence of causal attributions, Brewin et al. (1983) and Brewin (1984) proposed that a good outcome after accidental injury would be associated with causal explanations for the event. The design of the study was prospective with a structured interview being carried out at a hospital Accident and Emergency Department within a few days of the injury. The aim of the study was to find whether psycho-social factors could determine recovery time even in relatively minor injuries. The structured interview included details of the accident, a standard measure of the subject's causal attributions about it, and a number of other factors including job satisfaction. A follow up interview was conducted two to four weeks after the person had returned to work at which time the patient's level of psychological functioning was measured using the 12 item version of the General Health Questionnaire (GHQ12) and the stress and arousal checklist (SACL, Mackay et al., 1978). These self report outcome variables intercorrelated

(p <.01) and were combined to produce a single index of psychological disturbance.

The outcome measure took the severity of the injury into consideration by obtaining a more valid measure of recovery rate than that obtained by Allodi and Montgomery (1979). The 'adjusted recovery rate' was calculated as follows: two senior orthopaedic registrars at the Accident and Emergency Department provided estimates of likely recovery time, and the actual length of absence was divided by these estimates. A fraction greater than one would indicate that the patient was taking a longer than expected time to recover while a fraction less than one indicated that they were taking less than the expected time. The reliability of the estimates was provided (r_{22} = .80) and the actual recovery time and estimated recovery time correlated significantly (p<.001).

The most interesting finding was that those who felt more to blame for the accident recovered faster than those who blamed other people or other external factors. The subjects who returned to work more quickly also felt less tense and anxious on their return than did those who took longer relative to the severity of the injury. Subjects injured in an accident which was precipitated by an identifiable mechanical or environmental cause rated themselves as less causally responsible and culpable at both the first and the follow up interview. They were also those subjects who took longer to return to work, felt less alert and active and more tense and anxious. The results supported the idea that blaming oneself rather than others is linked to positive outcome, and it was interpreted as being adaptive. Multiple regression analysis was calculated to determine the contributions of these variables which, in total, accounted for 62% of variance (p<.001) in the following order of importance: feelings of culpability for the incident, receiving an income supplement, being married and being more satisfied with the job.

This study is the only one which links psychological factors with actual length of absence from work after injury, as distinct from other psychological factors (coping in Bulman and Wortman, 1977; and psychiatric symptoms in Malt,

1987; 1988). As such it advances the understanding of what factors may be important in determining how quickly a person returns to work, relative to the severity of the injury. Cognitive factors, in terms of the injury victim's appraisal of the injury, are found to be important. The final sample which was analysed may be biased, however, in that the regression was calculated on only 34% of the original sample of 97 subjects (the lost subjects refused, could not be traced, or returned to work within two weeks). The study does demonstrate, however, even at this low range of injury severity resulting in an average of 30 days off work, that psycho-social factors are important in determining rate of recovery. Specifically, once the influence of severity in limb injuries was controlled for, attributions about personal culpability in the incident, receiving an income supplement, marital status and job satisfaction accounted for 62% of the variance in recovery time. It is surprising that age was not included as a predictor of recovery rate, although in a heterogeneous hospital sample one would have expected it to have an influence.

There may be several other factors which could influence psychological state, for instance life events or chronic difficulties. The causal relationship between culpability and recovery time cannot be established, since the measure of culpability obtained *after* the return to work was associated with rate of recovery. In view of this temporal problem, the culpability measure does not act as a predictor but as a post hoc appraisal of the injury event *and,* by necessity, its outcome. Although the outcome of recovery rate is a good and useful one, the exact information upon which the orthopaedic registrars based their estimates is not described. In addition, these researchers conflate the concept of good 'coping' with a faster return to work, and there may an implicit value judgement in considering it so. Unless one views earlier return to work only in terms of indicating that the accident victim does not traumatised by the accident, would it imply coping. This point is discussed in Chapter 10.3. In Brewin's study, although an association was found between recovery rate and the measures of psychological state he acknowledges that recovery after an accident may contain at least two distinct components: 'one concerned with the speed of returning to work and one with self reported feelings of health and well being'. This study is the

most relevant to the present thesis in that it examines the same type of injuries (limb injuries) and it considers rate of return to work as the outcome of interest.

2.6 Studies of the reaction to not attending work through unemployment, as an analogy to convalescence. The study of the response to the sequela of injury, that is, convalescence is not a main aspect of this thesis but a review of the work on this is necessary to understand the model which is described in the Conclusions to the thesis, and also to understand the implications of the findings in the cross sectional study. There are no studies known which examine, prospectively, the experience of being off work for short periods of time due to common everyday injuries. The emphasis in the literature has been on the response to chronic illness (reviewed in Stone et al., 1979), or to becoming ill as a gradual onset of a change in health status, as distinct from the sudden onset of incapacity for the injured. There are studies of the relationship between psychological state and lengthy incapacity in chronic conditions such as back pain such as those reviewed by Romano and Turner (1985), but these are largely irrelevant due to the length of the convalescence. All of these domains are interesting but are irrelevant to the phenomenology of convalescing from a common, non life-threatening injury. Conceptually, that body of research on the experience of the unemployed is more relevant and probably most similar to the experience of enforced inactivity in the patient with a broken leg, or a bad strain.

A number of psychological aspects of the experience of unemployment may be difficulties for the convalescent, including depression and anxiety, changes in self esteem, inactivity, social isolation, cognitive changes and physical health. The main body of researchers who have tackled the issue of the psychological experience of unemployment are the group at the Sheffield Applied Psychology Unit (Jackson and Warr, 1984; Warr et al., 1979; Warr and Jackson, 1985). These studies consistently found that the unemployed report significantly higher levels of depression and anxiety than comparable samples of the employed. Jahoda et al. (1972) have argued that one central reason for the negative affective

state during convalescence is because the individual is deprived of what are called the latent functions of employment. Latent functions include the enforced activity of work, social contact beyond the family and a sense of communal purpose. Other proposed reasons for dysphoria during unemployment are the loss of control over decision making, planning and the sense of personal effectiveness (Bolton and Oatley, 1985; Fryer and McKenna, 1987). Both the loss of latent functions and the loss of control and personal effectiveness would be features of convalescence, even during brief absences from work. Beyond this, however, the analogy between the experience of unemployment and that of convalescence breaks down because convalescence is usually finite. In reference to this Fryer extends this idea and emphasises that it is the loss of control and 'agency' brought about by increasing poverty which is an important aspect of the appraisal of the unemployed person's situation (Fryer, 1988).

In many other ways there is close comparability between research on the unemployed and on people briefly convalescing from injury. As described, people who have been not very seriously injured are not 'ill' in the sense of feeling unwell and would feel the same constraints and frustrations at being unable to go about their usual activities, including work. Fryer (1988) acknowledges that research which deals with heterogeneous populations of the unemployed is relevant and important, but that there may be more homogeneous sub-populations within that larger population who may behave differently. Certain individual characteristics may act as mediating factors, between the initial event of losing one's job and the consequences of this. Fryer sees this as being a dynamic interplay of material circumstances, social institutions and unique aspects of individual persons. While proposing that the approach which an individual takes to his or her circumstances (individual agency) can be an important mediator between the experience of unemployment and consequent psychological distress, Fryer also criticises an approach which places too heavy an emphasis on individual agency, in terms of their ability to change their circumstances,

'It is important to not exaggerate the role of the individual, and thus err into

psychologism, by suggesting that an explanation of unemployment experience can be provided simply in terms of the individual characteristics of the unemployed. This perspective was a regrettable feature of work in the 1960s and 1970s conducted in buoyant economies on so-called "hard-core unemployed". Tiffany et al. (1970) for example, used the term work-inhibited to describe people physically capable of work but prevented because of psychological difficulties'.

Clear parallels can be seen between this approach and those explanations of speed of recovery or failure to recover in terms of personal dispositions of the individual, such as malingering. A balance is necessary. Nevertheless, a number of personality related factors which might make a person more or less vulnerable to distress during unemployment have been discussed in the literature. These include hardiness (Kobasa et al., 1982), neuroticism (Payne, 1988), and pro-activity (Fryer and Payne, 1984). The degree to which the individual feels attached to work in general ('employment commitment') is found to be a moderator of the experience of unemployment and is now considered to be a fairly stable dispositional variable (Jackson et al., 1983). In some discussions in the thesis parallels are drawn between convalescence and unemployment.

2.7 Conclusions. There is a real lack of empirical psychological investigation of the influences on recovery time. That there is variation in recovery time was made obvious by a series of research studies considering how well standardised measures of initial injury severity related to later outcomes. By and large the scales did predict such consequences as length of hospital stay, the cost of medical treatment and subsequent disability, such that those patients classified as more severely injured were more likely to be disabled six months or a year later (Bull, 1975; Galasko et al., 1986; MacKenzie et al. 1986, 1988). However, anomalous individual patients were found whose initial injury severity was not related to the longer term outcomes: less severely injured patients may not have resumed their usual activities when followed up, and more severely injured may have succeeded. In all these studies a percentage of those with low initial injury severity have not resumed normal activities, or 'got over it' when contacted up to a year later. Finding some reasons for this in terms of early predictors of outcome is the topic of

this thesis. Galasko et al., (1986) report that there were 'a number of individuals' in their study who felt that the accident had had a detrimental effect on their lives, but who considered they had experienced no specific restriction in activities.

These findings led some researchers (Galasko et al., 1986) to propose that some of the sequelae may be of a 'psychological nature'. Other researchers, going beyond the clinical features of the initial injury (MacKenzie et al., 1986; 1988) have sought demographic and social correlates of rate of return to work. The aim of research carried out at the Road Transport Research Laboratory (Galasko et al., 1986) was more particularly aimed at the cost of road accidents and the analysis was in terms of what type of 'road user' was involved, with attention only to other basic information such as age. The work by MacKenzie et al. (1986; 1988) represents a compromise between a large scale study and one looking at very basic demographic factors which are related to outcome after injury, and an attempt to ascertain the influence of social factors. In this heterogeneous sample of hospital in-patients they found that, after the degree of disability had been considered, only the level of income prior to the injury was associated with length of absence. The existence of a source of social support ('a confidant') was also associated with length of absence; in total 32% of the variance in recovery time was accounted for by the factors measured.

It is interesting that even when the severity of the injury is measured as accurately as is possible there is still a substantial amount of variance in recovery time which remains unexplained. Perhaps the reason there is this disparity between scores on the AIS and the ISS and outcome is explained by the fact that they were designed to compare trauma victims at the time of their injury rather than measurement for longer term outcomes. On the other hand, the researchers in all these studies, and in the present thesis, assume a good relationship between initial injury severity and long term outcome. Approximately 20% of the sample who had reported no disability at discharge were not working at the time of follow up.

A further strand of research looked at the social and demographic correlates of subsequent disability, although in some instances no standardised measure of injury severity was applied. One study of hand injuries (Goldwyn and Day, 1969) found no influence from psychological variables, and proposed that their sample were highly motivated to return to work. Nearly three quarters of the sample returned to work immediately which did not leave much scope for the influence of other factors; only 4% were still affected one year later but they were also identified as having more severe injuries. Design problems such as an unadjusted outcome of length of absence and the non-specificity of some of the measures renders the study relatively uninformative.

Two further studies considered the influence of psychological and socio-legal factors on recovery time. Allodi and Montgomery (1979) found that job dissatisfaction was correlated with recovery rate, those who were more unhappy at their job taking longer to return to work for a given level of injury severity. The statistical support for this conclusion was not strong, and the influence from other factors that were measured were not reported in any detail. Johns (1981) carried out a detailed study of disability after hand injury and found a strong influence according to whether the patient had claimed compensation, and according to the physical demands of the patient's job. In both this study and that by Goldwyn and Day (1969) because injury severity was not taken into consideration in looking at recovery time, the severity of the injuries was the dominant influence. The classification of the injuries according to severity was carried out by the researcher, possibly introducing some bias. Only descriptive analyses are presented, so the relative influence of such closely correlated factors as injury severity and the pursuit of compensation, is not known.

Two other examinations of injury sequelae found that cognitive factors, specifically causal attributions about the incident, were important determinants of coping with the injury. The well known study by Bulman and Wortman (1977) examined coping in a small sample of young patients with spinal cord injuries. They found that attributing the blame for the accident externally to other people or

environmental factors was associated with poorer coping as defined by their carers perception of the patient's adjustment. Brewin et al. (1983; Brewin, 1984) found in patients with relatively minor injuries requiring only one month off work, that certain socio-demographic and psychological variables were important determinants of time off work, once injury severity has been considered. All of the injuries in this study had happened at work, those severely injured patients in the study by Bulman and Wortman (1977) were involved in incidents at work and in leisure pursuits. In a field of research which is generally not driven by theory, these two studies are unusual in that they test the influence of the patient's cognitive appraisal of the injury incident.

Given this body of research, little is yet known about what factors might be associated with taking longer than expected to return to work. Job dissatisfaction was found in two studies (Brewin et al., 1983; Brewin, 1984; Allodi and Montgomery, 1979) to be associated with a longer period of absence from work, attributing the blame for the incident to external factors, including other people, was associated with poorer coping and a longer period of time off work. A lower level of pre-injury income and the lack of a confidant were associated with longer absence. Pursuing a compensation claim was found in one study to be associated with longer absence. Beyond this, the actual individual response in terms of length is not well understood. Further research needs to be carried out in sub-groups of the population in order to control for some of the larger sources of demographic variation. The population of police officers studied in this thesis were chosen specifically in order to control for some of the demographic variables found relevant by these researchers, such as income level, education level and type of employment.

Applying the findings of the above pieces of research to the present thesis is limited. Apart from the studies by Brewin et al. (1983; Brewin, 1984) and those by Goldwyn and Day (1969) and by Johns (1981) the majority were carried out on

a very broad range of injuries requiring hospitalisation. Bull (1975), Galasko et al. (1986) and MacKenzie et al. (1986; 1988) all used hospital in-patients as their study sample and included in that group were spinal injured and head injured patients.

The statistical analyses in these pieces of research are not informative as to the relative contribution of the variables measured since most often descriptive rather than inferential analysis is presented. This has the disadvantage that each variable is considered in isolation when the reality of recovery is that it is determined by a large number of variables which interact with each other. Some studies do not adequately control for injury severity and so this factor dominates the influence of other variables. Some other studies classify the injuries into three categories from minor to severe which introduces an apparent control for severity, but the range within each classification may be large. The use of injury severity rating scales such as the Abbreviated Injury Scale or the Injury Severity Score are not appropriate to measure injury severity at the lower less severe range.

Only two studies specifically looked at psychological sources of variation, although in the first of these (Bulman and Wortman, 1977) the outcome measure of coping lacked some validity and objectivity. In the context of the present thesis, that study carried out by Brewin et al. (1983) and Brewin (1984) is the most similar and most relevant guide as to how to proceed with the research in this area. There are clearly many other variables which could possibly influence recovery time which have not been tested in previous research.

Parallels were also drawn in this Chapter between the experience of convalescence and that of temporary incapacity due to a fracture or a strain to provide a context for some of the discussion and incidental findings of the present research.

Chapter 3: The study sample: Police officers.

Abstract. This Chapter introduces the population that was studied in this thesis. Police officers were selected because of their relative homogeneity of demographic characteristics, and because there is a relatively high incidence of injury among them. This is attributed to their age group (mean age 33 years) and to their type of work. Some aspects of the health context of the officers are discussed, as is a study which was carried out on the correlates of medical discharge through ill health. Some of the recent literature on police stress is reviewed and placed in the context of Strathclyde Force. The relationship between stress and the incidence of injury is discussed. A fairly full description of the work of a police officer in Strathclyde force is provided as well as an extensive description of the typical circumstances of injury on duty. In the course of carrying out this injury research very many other interesting possible topics for study became obvious and these are briefly mentioned in the Conclusion to the Chapter.

3.1 Introduction. The purpose of this Chapter is to introduce the reader to the population studied in this thesis, Strathclyde Police officers. The orientation of the thesis is towards how the injuries sustained by the sample interact with the occupational context in terms of when the officers can return to work after injury; and in some cases how the injuries are caused by their work. It is important to understand this context, and recognise in what ways it is like any other type of work, and in what ways police work is unique. A quotation from the Annual Report by the Chief Constable of Strathclyde Police will make it clear that police work is very varied:

'While the investigation of murders and other serious crimes tends to attract the limelight, most police work is less sensational and handled in line with well tried routines. These can be emergency or non-urgent and range from fires, suicides, sudden deaths, disturbances, and road traffic accidents, to lost children, stray dogs and minor complaints. In addition to the normal daily flow of routine matters, the Force has also to police many large scale events such as Royal visits, sporting

events, processions and demonstrations.' (Sir Andrew Sloan, Chief Constable of Strathclyde, address 1989).

Whether what the police do is termed a 'service' or a 'force' is never clear and is not consistently applied through all British constabularies. The two broad functions are underlined by the contrasting images of the bobby on the beat and public order squads. Police officers are required to display sensitivity and discretion in the first role and in the latter act in paramilitary fashion complying with orders which are not open to individual interpretation (Brown et al. 1989; Mitchell, 1990a). This contrast in roles can lead to problems in the execution of duty, requiring as they do quite contrasting approaches to the public. Police work can also be said to involve three major functions: law enforcement, including crime prevention and the arrest of lawbreakers; maintenance of order and minimising public disturbance; and public services, or informal front line social work. Added to these main functions are extraordinary duties such as those which were required at the Lockerbie Disaster.

There are four main sections in this Chapter: the first considers the physical health of the officers and levels of sickness absence in Strathclyde Force, including a study of medical discharge in this population. The next section looks at the psychological health of police officers. Psychologists have only relatively recently been permitted within the various Forces to conduct research, the consequence of which is a burgeoning literature on 'police stress'. Some of the broad conclusions of this research are provided with particular reference to a review by Brown et al. (1989) and to a study conducted at Grampian police by Alexander et al. (1991). The general conclusion of such studies is that there are certain aspects of police work, for instance shifts, which are conducive to both physical and psychological distress. In many other ways, the work of a police officer is similar to any other job which requires contact with a potentially aggressive or angry public, such as bank tellers or nurses. In the above studies, however, a major source of stress was identified as poor methods of 'man management'.

The third section of the Chapter is to provide some 'local colour' to the academic studies of police. The material for this section is drawn from conversations and interviews with officers. These descriptions are sometimes instantial of the conclusions of the empirical studies as regards high levels of demand in police work, and in some ways present a more benign picture of what it is like to be a police officer. The final section of the chapter describes in detail the circumstances under which police officers are injured, with an emphasis on injuries sustained in the line of duty.

3.2 Illness and injury absence in Strathclyde Police Officers. Strathclyde Force is the second largest in Britain after the Metropolitan Police; at present there are 5286 constables, out of a total of all ranks of 6825 (Strathclyde Regional Council, 1989). The area policed by Strathclyde is very large and includes both urban and rural beats. Given the number of employees, substantial amounts of time are lost through ill health absence: 122,000 days for all ill health reasons in 1990, compared with approximately 90,000 for 1989. Of social and political interest is sickness absence as a consequences of physical altercations between the police and the public; in 1990, 275 Strathclyde police officers were assaulted, resulting in the loss of 6234 working days that year. An additional 2841 days were lost in that year due to other on duty injuries, including road traffic accidents.

A proposal was made to Strathclyde Police by the Medical Department for the setting up of an Occupational Health Unit to provide broad based treatment for officers. The rationale for this Unit was that, in the case of certain types of illness or injury, early intervention, or taking a more active approach to rehabilitation, might prevent a lengthy convalescence. The sorts of injuries studied in this thesis would be particularly amenable to early physiotherapy at the acute stage, but often this is not provided until too late. The incidence of injury generally is increasing within Strathclyde Force and studies such as the present one provide insight into what can be done to alleviate problems associated with injury convalescence.

3.3 Medical discharge. In some instances, medical discharge can be recommended if the officer is deemed unfit to continue active service. In 1989 there were 76 medical discharges, which represented 43% of all the 176 officers who left the Force for all reasons (such as through service retirement, ill health retirement, being dismissed, or who resigned). It is clearly an important fiscal decision whether to retain an officer, and to balance the loss of expertise and dedication against the potential for periods of absence from work. There are obviously circumstances under which removal from the Force is inevitable, but there may be other cases in which the provision of permanent modified duties, or even occasional modified duties, may be the answer. The orientation of this thesis is to develop a method of identifying individuals at risk of protracted absence, on the basis that the early provision of clinical or psychological support may avoid the necessity of this ultimate solution.

To look at the circumstances of medical discharge, a retrospective study was carried out on a series of officers for whom medical discharge was recommended in the year 1987 (McLay and Mitchell,1988). In broad terms, there are two categories of reasons for medical discharge; one is 'psychological' and the other 'physical'. An aim of the study was to discover if there were differences in absence history between officers discharged for these broadly different reasons. Complete health histories were available for only 31 of the 60 who were discharged on medical grounds that year. The reason for this discrepancy is that Glasgow Police amalgamated with other police forces in 1975, and complete records are held at Strathclyde Headquarters only for those officers who have always served in Glasgow. To be included in the psychological category the reason for the discharge would have to be 'stress', 'anxiety', 'depression', or similar term, such as 'nervous debility', with no further definition. Officers included in the other, 'physical', category would be suffering from illnesses which were more clearly of a systemic nature, such as myocardial ischaemia, or osteoarthritis.

The two groups ('physical' and 'psychological') were compared with serving officers who were the same age and gender, thereby generating two comparison groups. The officers' medical records were reviewed, and a number of categories of absence generated. In order to render the health histories comparable with each other regardless of length of service, the total number of days of absence were divided by the total period of service. Amongst others not reported here, the indices of absence were: (i) the total absence from work due to illness and injury *before* the final absence episode; (ii) the frequency of on duty injuries requiring absence and the consequent absence occasioned by these injuries.

The absence rate for the two comparison groups was the same: almost three per cent of their total service for both groups, which may reflect a more usual or typical rate of absence. In contrast, the previous total absences for the 'psychological' and the 'physical' groups were significantly different ($p = .0001$); a mean of 5.6% of total service for those officers discharged for physical reasons, and a mean of 9.2% of service for those officers discharged for psychological reasons.

Of greatest interest for this thesis is the finding that the frequency of reporting on duty injury incidents, whether requiring absence or not, was significantly higher ($p = .0001$) in the psychological group compared with the serving comparison group. This was not found between the physical discharges and their comparison group, although the same trend was evident. It could be that the degree to which officers were likely to report incidents on duty, which they are expected to do, is a predictor of the outcome of discharge. It may also be that these officers actually did find themselves in more injurious situations, either because of not being able to control altercations with members of the public, or because of having to work in an area more hostile to the police; either of these would constitute a chronic operational stressor. Despite this difference in the *frequency* of reported incidents, the total previous absence from work for on duty injuries was not significantly different between the psychological and physical group, although there was a trend for those with psychological discharges to be off work for longer.

There were other differences between the groups. The two discharge groups were different in age, the psychological group being significantly younger than the physical group. Perhaps the symptoms and way that the patient presented him or herself would be seen as having a 'psychological' component if the officer was young. It is a cultural and medical expectation that young people are physically and psychologically robust; in contrast, in considering their suitability for continuing service, a more benign consideration may be made of the older age group. The incapacity of the older officers is perhaps legitimised by their age and by a perception of their having 'done their bit' for the police service. Quite possibly the younger officers may be perceived as not being genuinely incapacitated and would be categorised as psychologically disabled.

The reputed desire of officers to achieve a medical discharge is exaggerated. The notion that it is the norm, rather than the exception, that officers will manipulate their situation in order to achieve a medical discharge is not substantiated by empirical evidence. The police welfare officers are involved with those being recommended for discharge in that they compile a report on the officer's social circumstances for the Chief Medical Officer. The welfare officers are involved in calculating the pension entitlement, and in providing counselling for both the officer and his or her family when the discharge is imminent or has happened. Their testimony leads to the conclusion that the possibility of a medical discharge is extremely threatening to most officers, and far from being the 'million dollar handshake', a medical discharge is an event which signifies clearly to the officer that he or she is too weak and incapacitated to continue working as a police officer.

Also the suggestion that officers manipulate their way into a medical discharge ignores the important fact that discharge is recommended by the Chief Medical Officer, based on objective medical evidence. The trepidation that officers feel at being summoned to see the Chief Medical Officer is not because they fear being advised to return to work; quite the contrary, their fear is that they will be deemed unfit to ever return to work. The idea that an officer *wishes* to be told that

he is unfit, and fired from the job, is the product of the cognitive biases discussed in Chapter 1. Attitudes like this are reinforced by articles such as that by Meredith (1984). This writer proposed that police officers will consciously push themselves to the limits of personal safety, and sustain injury, 'frustration with the system being an *unconscious motivator*' (my italics). These perceptions could lead one to believe that not only do the officers wish to be fired, but they also wish to injure themselves in the first instance.

Medical discharge is the most drastic and least creative solution to employee health problems, so the reasons for such discharges and the consideration of other solutions require attention. Thirty three (55%) of those sixty officers were discharged because of psychological difficulties; given the potential wastage from this source, research is being undertaken in several constabularies to find the possible stressors in police work. A critical review of some of this research is provided in the next section.

3.4 'Police stress'. Police officers, as do firefighters and ambulance workers, come face to face with death and violence in the course of their work, which places high demand on them. The incidents are, fortunately, relatively infrequent and, indeed, Duckworth (1991) proposes that some officers do not necessarily find these experiences distressing. A number of different stressors have been identified within police work. These can be conceptualised as operational (that is, to do with carrying out the job at street level); or organisational (that is, those aspects of the job which arise from the management of personnel and the structure of the job). Stressors can also be thought of as acute or chronic. An example of an acute operational stressor would be attending a fatal road traffic accident; an example of an acute organisational stressor would be an officer being transferred to another location or post against his or her wishes, a event which happens frequently, or undergoing an inquiry into some alleged breach of discipline or conduct. Chronic operational stressors would include working in an area in which there is drug related violence combined with a disrespect for the police, or a lack of activity or repetitive activity leading to boredom on the job. Chronic organisational

stressors would include structural aspects of the job such as the socially hostile shift system, the particular managerial style of the section sergeant or shift inspector, or working with poor quality equipment. Felt stress is often referred to as 'low morale', and maintaining morale is a problem in almost all police forces. Administrative pressures, a sense of a lack of appreciation from the public, and an increasing sense of alienation from the community can all contribute.

Harland and Brown (1989) propose that '*stress* is complex, interactive, and highly individual in nature, and most discussions of stress focus on its negative effects in terms of health, wellbeing and productivity'. For the police service they usefully distinguish between stressors, stress and distress. These are defined as follows: *stressors* are potential external sources of adverse reactions; *stress* is 'felt stress' which is the negative impact of events or chronic difficulties that one perceives; and *distress* is the experience of specific symptoms, such as a heart attack, anxiety or depression. Making this distinction is useful in that the term stress can be used to imply a whole range of environmental stimuli and individual reactions, not infrequently within the same text.

Although this point will be expanded in Chapter 8, duty at Lockerbie presented a whole new order of acute stress. The debate continues within the police environment, and amongst psychologists, whether police officers should be able to withstand acute operational stressors. It is estimated, however, that only about 6% of calls for police assistance bring officers into potentially emotionally demanding situations such as a child fatality, a suicide, a high speed car chase, or an encounter with a violent offender (Brown, 1989). The view held previously was that experience in the job 'toughens' and protects officers against these extreme duties. Whether this is correct, or whether it is correct for all officers, is open to debate and requires clarification of the psychological mechanisms which are at work (Mitchell, 1990a). As discussed in the next section, however, more insidious sources of felt stress and those deemed to result in high levels of sickness absence (Alexander et al. 1991), are to do with the organisational aspects of policing rather than operational aspects.

In both the study of Grampian police (Alexander et al. 1991) and of Hampshire police (Brown et al. 1989), felt stress is associated with the usual organisational and managerial problems common to many occupational settings. Examples are poor recognition for effort, impediments to work achievement and completion, and relationships between management and the rank and file. The problems of boredom and the sense of not being utilised to full potential and occupational overload, for example, frequent court appearances and large amounts of paperwork, are cited as major difficulties.

These sorts of concerns and complaints are substantiated by the answers to a particular question in the first prospective study (Chapter 7). The question posed was whether the officer ever got so fed up with the job as to feel like walking out. Specifically, they were asked to indicate how much they agreed or disagreed with the statement, 'I quite often feel like walking out on my job for good', and why they sometimes felt this way. The answers gave insight into sources of dissatisfaction within this Force. Overall, a quarter of the sample agreed with the statement, while 65% disagreed, and the rest were undecided. Fifty four reasons were given by the officers (Table 3.4.1), and the figures in brackets indicate the number of times that same reason appeared. Most represent the chronic organisational stressors alluded to above, although some mention specific acute operational stressors. Purposely, the data has not been categorised and tabulated because of the loss of vernacular descriptions of these specific dissatisfactions which would result.

Table 3.4.1
The reasons officers feel like leaving the job.

Management. 'supervisors treating me like a school kid'; 'bad man management' (3); 'incompetence of upper management'; 'the apathy shown by senior management - the attitude that "it worked well in the past" and who resist even slight change for the better'; 'decisions of supervisors at times' (3); 'lack of backing from supervisors' (3); 'lack of recognition for good work'; 'supervisors incompetence' (2); 'lack of correct leadership'; 'being treated like lower class citizens by senior officers'; 'occasionally I am very dissatisfied with the way that I see the job going and the way lower ranks are looked on with disdain as foolish'

Court system. 'court appearances where plea bargaining goes on'; 'the fines imposed by the courts'; 'the inability to bring offenders to justice due to lack of acceptable evidence / and offenders at court being treated with unacceptable leniency'

Shifts. 'badly thought out shift rotas (3); 'the shift system and strain on family life'

Underload and overload and frustration. 'lack of man power'; 'bad day with a lot of stupid domestic calls'; 'frustration' (2); 'boredom'; 'pressure'; 'the pressure placed on individuals in terms of paperwork and low manning levels. Covering a very busy area with fewer men than is required'; 'tasks asked to undertake'; 'after a particularly dissatisfying shift'; 'frustration at lack of commitment in others; 'poor equipment'.

Complaints. 'unfounded complaints against the police' (3); 'when abused by the public, both physically and verbally' (2); 'getting messed about and getting complained about for only doing my job'

Lack of control over career. 'inability to formulate career plan'; 'better prospects elsewhere'

Acute stressors. 'a particularly upsetting incident'; 'dangerous situations, e.g. fights, hold ups'

Non-specific complaints. 'conditions' (2); 'the job in general which, in my opinion has deteriorated a lot'; 'minority within the police - (idiots)'

The second prospective study in this thesis included a detailed assessment of job satisfaction which was administered by interview. Although the overall job satisfaction felt by the officers was not low, consideration of the rating of individual aspects informs about the types of chronic dissatisfactions which prevail. Table 3.4.2 presents the percentage of the sample in the second study (n = 52) who acknowledged being moderately to extremely satisfied with particular aspects of their work ('percent satisfied'), the modal response in terms of satisfaction is also given ('mode'). A clearer definition of the meaning of the items is obtained from the interview schedule (Appendix F).

Table 3.4.2

The officers' ratings of their satisfaction with sixteen aspects of their work.

Aspect	Percent satisfied	Mode
Physical aspects	55%	moderately
Freedom to choose methods	47%	not sure
Colleagues	66%	moderately
Recognition for good work	49%	moderately
Supervisor	58%	moderately
Responsibility given	61%	moderately
Pay	78%	moderately
Use of abilities	73%	moderately
Relations with management	47%	moderately dissatisfied
Promotion chances	38%	*no modal response*
Way police managed	34%	moderately dissatisfied
Attention to suggestions	45%	moderately
Hours	52%	moderately
Variety in job	66%	moderately
Job security	85%	very satisfied
Job as a whole	83%	very satisfied

Scrutiny of Table 3.4.2 indicates that there is variation in the number of officers who were satisfied with different aspects of the job. The fewest (less than 50%) were happy with what could be called interactions with management; most (more than 70%) were satisfied with the use of abilities, pay, job security and it is interesting that the rating of the job as a whole was high. This would imply that while the officers feel that the job is a good one there may be certain practices or certain individuals who detract from this overall satisfaction. The perceived chance of promotion yielded no modal response indicating that different individuals, probably accurately, each perceive their chances in individual ways, some think there is a good chance while some think there is no chance.

In the Hampshire study (Brown et al., 1989), two particular aspects contribute substantially to felt stress in the officers, and this is also true in Strathclyde police: transfers to new posts in the region without adequate warning or preparation and the discipline system. Officers are moved within a constabulary as part of a discipline action or as a consequence of a complaint. The officers who are moved for other reasons, usually described as 'career development' are unable to distinguish whether they are being moved because of some misdemeanour or whether they are just being moved. This often leads to a great deal of worry and soul searching. Within the 6 months prior to the Hampshire survey being conducted, 22% were either moved from specialist work back to division, or were posted to another station. From interviews with the officers in the present study it is clear that transfers result in psychological distress and lowered morale. Whatever benefits can possibly accrue from such moves are more than counteracted by the loss of efficiency, the rise in psychological symptoms and, at a practical level, the unfamiliarity of the officer with the new area. In the course of research for the Police Requirements Support Unit of the Home Office, the opinions of senior officers' from Strathclyde were surveyed regarding the relative stress of critical incidents. In the list was included one organisational stressor: 'unwelcome transfer to other duties'. Amongst the most senior officers in the Force, being given an unwanted transfer was rated as the third most distressing incident. It was rated third

after 'attending at a mass fatality' and 'attending at a child death', and more distressing than such incidents as attending a suicide or a fatal road traffic accident.

As regards the discipline system, 28% of those surveyed in the Hampshire study had been involved in a disciplinary inquiry or were the subject of a complaint during the previous six months. The Grampian study demonstrated being involved in a disciplinary inquiry to be associated with a rise in symptoms of anxiety. One of the features of the discipline system is an inexplicable lack of follow up or concluding information back to the officers, particularly in the case of complaints. There can be no reason why officers are not informed of the outcome (often benign) of an inquiry, but this seems to be common practice not only in Strathclyde (Alexander, et al. 1991). Many officers suffer needless months of worry over the outcome when the issue has already been concluded and the officer exonerated. The researchers in the Grampian study state,

'Many officers claimed that there was a lack of feedback during the inquiry as to what stage it had reached. These criticisms (were not made) about the Complaints and Discipline Unit investigators, but against Divisional officers detailed to conduct preliminary investigations into minor complaints'.

From interviews, the officers perceive the way in which transfers and discipline enquiries are carried out is indicative of a lack of commitment to create a satisfactory working environment for officers.

How do officers deal with stress? In Strathclyde force as in others, alcohol is widely perceived as a form of relaxing self medication to help 'unwind' after work. Particular times to drink become associated with certain shifts, thereby leading to regular drinking; of the subjects in the second study (Chapter 9), 38 officers acknowledged drinking alcohol, and reported consuming an average of 12 units a week (using the usual measures of a single measure of spirits, glass of wine, or half a pint of beer) and in the whole sample (n = 53), nearly 10% regularly drank alcohol over the 'safe limit' for males of 21 units a week (Scottish

Council on Alcohol). From this sample were taken groups of officers at the two extremes: those who drank no alcohol or negligible amounts (n = 15, none or 2 units a week, the mean for the group being less than one a week) and high drinkers (n = 11, 12 units or more each week, mean for the group was 19 units a week). These two groups were compared on a number of variables of interest. There was no difference in length of absence, but there was a significant difference in the measure of self reported anxiety (Hospital Anxiety and Depression Scale; Zigmond and Snaith, 1983). Heavy drinkers reported significantly more anxiety than light drinkers, but there was no such difference on the depression scale. They were also slightly older (36 compared with 34). This provides some limited support for the idea that alcohol is used by the officers to calm themselves. Although the direction of causality cannot be established, such self medication would undoubtedly be unsuccessful, particularly if the practice is continued over a long period.

In the Grampian study (Alexander et al. 1991), 15% of officers of both genders reported levels of alcohol consumption which would be considered 'moderate' or 'high' by the Royal Society of Medicine criteria, and two percent of these males would be categorised as 'high' risk. The Grampian researchers point out, however, that these rates do not differ from other high risk occupations, such as firefighters, prison officers or nurses. Using rather different methods of calibration, the Hampshire study (Brown et al., 1989) found that 4% of their sample were teetotal, sixty nine percent drank 'occasionally', and the remaining 27% drank daily, ranging from one unit to more than six units.

3.5 The relationship between felt stress and the risk of accidental injury. Many studies have attempted to link felt stress to physical or psychological distress manifested as illness. A recent volume, the *Handbook of Life Stress and Cognition* (Fisher and Reason, 1988) reviews the substantial literature on the subject. The present study concerns accidental injury, so it is important to consider the connection between felt stress and the likelihood of sustaining an injury. The arrest of a violent offender is obviously that aspect of operational policing which is most likely to result directly in injury, but there are indirect ways in which the stress

an officer may be experiencing can lead to injury. Severe and chronic stressors can lead to cognitive dysfunction, manifested as absent mindedness or inattention, poor or slow decision making or forgetfulness. These factors may result in a road traffic accident or other accident. Stress may also become manifest as increased irritability with the public, possibly leading to more aggressive handling of a situation which may be diffused by more benign methods. There may also be an increase in fights at home which, in turn, can lead to an increase in alcohol consumption and a commensurately higher risk of tripping, slipping or stumbling. Specifically in regard to the likelihood of sustaining an injury, Connolly (1981) found a significantly higher incidence of distressing life events among a group of injured males than in a control sample, and interprets the injury incident as simply the latest event in a series of distressing life events. Any of the stressors described above, in acute or chronic form, could render the individual vulnerable to ill health or at risk to physical injury, which is of more interest to the subject of this thesis (see Chapter 7.14). Identifying the relationship between felt stress and the *incidence* of accidental injury is beyond the scope of this thesis, but is a topic which will be studied in the Force in the future.

3.6 What is involved in the work of a police officer? As the quotation at the beginning of this Chapter from Sir Andrew Sloan indicates, controlling crime in the sense of apprehending thieves and muggers is only part of an increasingly complex job. The fundamental task of the constable is to 'guard, watch and patrol' the streets and to be ready to react to any incident to which they are called. They can be on foot patrol, covering areas of up to 8 miles each shift or in mobile patrol in a car or a van. The officers are linked by radio to a local or a central control, working in pairs or alone. On the beat, it is generally true that the public expect the police, as figures of authority in the community, to be experts on a wide range of topics, expecting quick and correct decisions on any one of these. The public may see an officer as indecisive or not performing the job correctly if he or she seeks guidance. An acute awareness of these expectations coupled with a concern to maintain authority and an inability to be an immediate expert on so many subjects may produce role strain, particularly in younger officers.

The type of call and their frequency depends to a large extent on the geographical, and hence socioeconomic area, being policed. Depending on the area, the Police are variously seen as a welcome public service or as the enemy. Police officers often act as front line social workers and as lay psychologists in dealing with the highly sensitive and potentially volatile situations to which they are called. At these calls, the nature of which is never obvious until arrival, officers can feel stress as a consequence of an inability to alleviate human suffering in the obviously awful and marginal existences which are the lot of many people. A fairly common example would be to find children left alone at home in filthy conditions, entailing a painful decision that it may be in the children's best interest for them to be taken into care. Or attendance at a disturbance created by the mentally ill, who are in 'community care' and who have forgotten or refused to take medication. A less taxing but equally distressing circumstance for more sensitive constables concerns that need to charge an elderly man involved in a minor road accident, and revoke his license. In this situation the officer must balance the interests of the community in protecting other road users from an incompetent driver, with the fact that the ability to drive is probably an important factor in the elderly man's independence and mobility. The decisions that they have to make are often painful, conscious as they are of the consequences of those decisions. In general they have the sense that they have to assist or deal with people for whom nobody else seems to have responsibility.

Officers are frequently called to domestic disturbances; what the officer can expect on arrival is quite unpredictable. One of the first problems when they get there is to sort out who is who, and who is at fault; and a typical example of one of these situations will illustrate their social complexity and the sorts of decisions facing officers attending a call. In one instance, a young woman telephones for police assistance to a flat in one of the more run down Glasgow housing estates. The call is made from a public telephone and on arrival the officers meet the woman on the common stairway to the flat. She is dishevelled and clutching a baby. She is protesting loudly and very excitedly that she has just been assaulted by a man in

the flat. Inexperienced officers might immediately assume the case cut and dried, and arrest the male. However, more experienced officers know that domestic disturbances are never so simple.

Their knock at the door of the flat is answered by a well built, bare chested male bearing marks of a recent struggle. Inside the house are two more women and several half naked screaming young children. One of the women is the man's wife, and the other is his girlfriend and mother of the baby being held by the woman on the stairs. It transpires that the woman making the complaint had been babysitting and had drunk some beer left in the house. The man and the two women had been out drinking and were now intoxicated. On their return an argument had ensued involving the babysitter. The babysitter had tried to attack the man's wife and, by intervening, the man had suffered the ferocity of the babysitter's wild lashings. This explanation appears to fit the evidence and seems to the officers to be the most plausible; to defuse the situation, the babysitter is taken by the officers to her home nearby. She is the cousin of one of the women in the house and once the effects of the alcohol have worn off she will no doubt be welcomed back into the fold.

The officers were faced with untangling a complex social situation in which, based on very little or biased information, they must decide on the correct course of action. The issues about which they had to decide included, whether there was any evidence of an assault, establishing the 'responsible person', whether any of them were capable of taking care of the children and, generally, how to resolve the problem. All of this requires considerable diplomacy, at least a working knowledge of psychology in terms of understanding behaviour and likely reactions, and making the correct decisions under pressure as to any legal implications of the disturbance.

3.7 Injuries on duty. In the course of carrying out the present study of injuries, there was no difficulty in obtaining clear and correctly sequenced accounts of the injury. Police officers are accustomed to accounting for themselves whether to their sergeants, to the courts or, if things go wrong, to a disciplinary inquiry. A

large amount of paper work is involved in police work and officers are skilled at writing reports for evidence.

Injuries on duty can occur in four different ways: by an offender assaulting the officer in the course of an arrest, sometimes called a resisted arrest; by falling or tripping while chasing a suspect; in a road traffic accident; and in any of the ways in which one can injure oneself whether at work or not, for example, by slipping on ice. Police officers, along with others in the public service who work in areas of potential interpersonal tension, run the risk of assault in the course of that work. Bank clerks, psychiatric nurses, security guards and prison officers are all vulnerable to assault. Officers, in their line of duty, come upon extremely dangerous and threatening situations. Appendix K presents the description by an officer of a murder attempt made against him. In this the assailant used the cord from the officer's radio to attempt to strangle him while help was being summoned. Officers describe that their 'adrenalin' helps them to persevere in the face of these assaults and serious situations, and it is perhaps surprising the high degree to which the job involves hand to hand combat.

The circumstances under which an injury occurs changes the person's appraisal of that event. Brewin et al. (1983) in their study of recovery from industrial injuries, observed that accident victims make different attributions about the cause of these events. In the present work, which includes people injured on duty and off duty, different attributions were made by the subjects whether the injury occurred at work or not. These were in the expected direction: people injured at work perceived the incident as not being their fault or having been caused by them. A more detailed analysis of these perceptions was possible in the semi-structured interviews carried out in the second study (Chapter 9). Officers were asked to speculate on who, in an altercation in which the injury had happened, was at fault. Although most replied that it was the fault of the person whom they were arresting, some officers entered into a discussion with the interviewer about moral issues, and the relative roles of the suspect and the police officer. This included

considerations of such topics as the relative social background and social advantage of the officer over the person he was arresting. They also queried whether the suspect really intended physical harm, or at least to harm quite so seriously; and they also understood why the suspect struggled to break free, it seemed a quite natural response to them. In a sense, it was quite surprising that the issue was not black and white, and that the officers could clearly see that there were several aspects to the issue of blame in these circumstances.

Injury on duty can result from a direct blow by the hand, or from weapons which are frequently simply the object which most quickly comes to suspect's hand. Housebreakers use metal bars to gain access to properties and these implements can become weapons. In the fast moving events, it is sometimes not clear what the weapon is until too late. One officer relates that he

'...went to a disturbance. On arrival I saw a man weilding a stick. I challenged the man to drop the stick, but he attempted to strike me on the head with it. I put my arm up to defend myself and was struck on the hand with the weapon which turned out to be a metal bar'.

Self protective gestures in breaking a fall or a blow explain the relatively high number of wrist and hand injuries. Another officer reported:

'I was chasing four people who had been in a stolen car. As I reached forward to catch hold of one youth he turned and hit me in the face with a bag containing tools. I overbalanced but managed to grab hold of him. Both of us fell to the ground and I fractured several bones in my hand.'

These altercations can lead to one or both participants falling down a stair or against a wall. In one situation the officer had his hand purposely pushed through a glass door and was then punched and kicked.

When attending a domestic disturbance there is no way of truly predicting what the officers will have to deal with. It is interesting that officers perceive a lack

in their initial training, or continuing training, in appropriate techniques of self defense. In the following situation, the officer was fortunate to escape with only a fractured scaphoid:

'I went to a disturbance at a house. (there was) A fight with hatchet and knives between a mother and son. The son assaulted me .... the mother assaulted my partner'.

The animosity, violence and disrespect which is sometimes meted out to the officers is evident by the following example in which the officer fractured a bone in his hand,

'while on duty, arresting a person he began to struggle violently. I was kicked, head butted and spat on'.

The risk of injury varies geographically and may be related to local social mores regarding fear of the police. Taking two examples, Bearsden is a middle to upper middle class area is Glasgow, while Castlemilk and Easterhouse are both large council housing estates. People arrested in Castlemilk and Easterhouse tend to put up a fight in which entire families may become involved, the accused will muster whatever support is available, which could be friends standing around or their fighting dogs. Two subjects in the first study had attack dogs purposely set on them. On the other hand, youths who create a disturbance in Bearsden would typically come quietly at the time, although they may complain about unfair or 'brutal' treatment by the police to their parents, who may in turn lodge a complaint with the officers' supervisor (which may be, in a sense, simply another form of weapon).

Another important risk factor is the amount of alcohol that has been consumed by the person or people the officer is trying to arrest. In one interview in answer to the question about what had caused the situation in which the officer had been injured, the answer was 'in one word - drink'.

The perceived and actual level of manpower provision is a controversial subject, and the inability of officers to get fast and adequate back up when they are in dangerous interpersonal situations was mentioned by a number of officers, as for example,

"I had arrested a man on a warrant when I was surrounded by an angry and violent crowd. Assistance was summoned but took too long to arrive."

This officer acknowledged being frightened of the dangerous crowd, and was scared of being seriously injured or killed. He also felt great annoyance at the lack of backup and assistance. Another situation is described in this way: The officer was,

"in the process of arresting the driver of a motor vehicle who had refused a breath test when six of his friends obtained his release by assaulting me and my colleagues" (with a variety of weapons including a broken bottle).

This officer subsequently resigned from the police service during convalescence.

Only if assistance arrives can the officers be released to attend hospital but more often they have to bring the suspect to the police office for charging and complete all the necessary paperwork before they can attend for treatment. One officer believed that the amount of walking that he was required to do after an arrest, before he could seek medical attention, accounted for the length of the recuperation period required.

Apart from direct assault or injury which results from an arrest being resisted, the degree of physical exertion which is at times required on the job can also be conducive to injury. At a moment's notice the officer may be required to run through back gardens, over rough wasteland or over walls chasing a suspect. All of these are hazards which can result in straining ligaments of the ankle or

knee, or in fractures and strains as a result of tripping and falling. In recounting these activities, some officers describe that in the desire to catch the suspect they may have been careless in the way that they were running, or what they were doing. In one pursuit in which the officer badly injured his knee:

'I was chasing a group of youths and was about to grab hold of one when I lost my footing on the ice and snow underfoot, slipped forward over what looked like a short wall but which had a 15' drop on to tarmacadam on the other side'.

In the context of running and giving chase, it is interesting to hear the officers describe the physical restrictions of their uniforms which are thick wool and tightly tailored. I was asked, 'Have you ever tried to run after a 14 year old wearing a track suit, through gardens and over walls while dressed in a thick suit and heavy leather shoes?'. I hadn't, at least not knowingly, but I understood that the uniforms were seen as a hindrance in the more active parts of the job.

3.8 Criminal Injuries Compensation. Compensation for being injured on duty is often cited as a reason for protracted absence. The following description of the how Criminal Injuries Compensation operates might put this explanation in perspective. Only officers who are the victims of criminal assaults are eligible to receive compensation for personal injury and for financial loss, such as earnings. There are, however, limitations on the claims. The minimum award that the Board can make is £750, rendering most claims for the types of injuries studied in this thesis ineligible for consideration. Compensation can only be awarded for injuries sustained while arresting or chasing a miscreant if that injury arises from direct assault or from what is termed 'an exceptional risk' taken in the course of a chase (Louw, 1990). In other words, not all injuries sustained during a chase would be considered: falling from a roof would be considered while tripping on rough ground would not. Decisions are made on the basis of general practitioners' notes and hospital records. Collating the information can take up to two years, by which time many officers have forgotten that they put in a claim.

3.8a Research in the police context: the presentation of the research to the officers. One difficulty in any research in the 'real world', in contrast to a clearly delineated 'laboratory' situation, is the potential for confusion in the minds of the subjects about the purposes of that research. This may be the case especially when carrying out research into areas that are important to practical aspects of one's life, such as one's occupation which is directly related to one's ability to earn a living. These issues are important to the success of research, for instance, to do with occupational stress. Examples are that currently being carried out by Shirley Fisher (Strathclyde University, Glasgow) with Scottish prison officers or that carried out at Grampian constabulary with police officers (Alexander at al., 1991). Great efforts are expended by the researchers to assure the subjects that the data is either anonymous, or will be treated confidentially and is distinct from any records kept by the employer.

In a similar way the success of research into the psychological status of other groups such as the unemployed (for example, Bolton, 1984) depends upon the building up of trust between the researcher and the participant. Bolton's study bears directly on the issue of separating out the purposes of the research with those of the employer or, in the case of the Bolton study, the authority which dispenses benefits during unemployment. In her study, the participants were interviewed by the researcher in the Jobcentre, and this undoubtedly led to worries on the part of the participants that their answers had the potential to influence their eligibility for benefits. The assurances given to the participants are described in Bolton (1984): and often to assure is all that one can do. In many ways, however, the success or failure of such projects depend to a very large extent on the skill and sensitivity of the researcher in understanding how to talk to the participants and how to present the research.

This issue was a concern for the present study, and the problem may even have been exacerbated by the fact that police officers were the subjects for study. It may be the case that police officers are a particularly hard group to assure and put at ease in this matter and this may be explained in a number of ways. The purpose of the job of being a police officer is, after all, to be vigilant of and even suspicious of peoples' motives and actions. It is also to do with the occupational context of the police which is hierarchical and has a built in discipline system for any infringements of good conduct on the part of officers. These two factors may enhance the perception by officers that the information they provide could be used in some way which might have an impact on their employment. Considerable efforts were made on the part of the researcher to allay these concerns.

A further issue in dealing with real populations and in researching issues which are important to the participants is that to do with the honesty or otherwise of the participants' responses. It is perfectly conceivable that participants may dissemble in ways that they may believe appropriate to their status of being unemployed, being convalescent or being a satisfied worthwhile employee. These strategies would be adopted to protect their livelihood and to present what they believe to be a cohesive picture to the researcher of being ill, or being unemployed in order to insure the continuance of their absence from work. This necessitates an a priori decision on the part of the researcher whether to 'believe' the participants' responses or to doubt them. The former would reflect an acceptance of all that is being reported while ignoring the obvious constraints and filters that any participant will place on their responses in view of their concerns about the purposes of the research. The opposite position would be to be cynical about the veracity of the data and to make decisions about its value based on an a priori bias of the researcher on the character and nature of the participants as to whether it is likely that the participants would be straightforward. This however, is embracing a problematic area in that any decision on the part of the researcher about the honesty or otherwise of their

subjects must by necessity be based on the researcher's own beliefs and biases. In turn, these beliefs and biases may be the result of heuristics, or working models, about the subjects whom one is studying. In this way the attempt to collect data on a particular population could be obfuscated by the operation of these cognitive biases and, as such, reflect a similar process to that previously described (Chapter 1 of this thesis). Police officers are salient members of the community and there are few members of the public who would not hold an opinion (either positive or negative) about their practices and character. These biases are based on the acceptance or rejection of newspaper reports (for example, to do with the falsification of police evidence) or such personal experiences as the actions of individual officers when one is caught for speeding. The researcher must suspend these biases to produce a worthwhile scientific product, in the same way as a researcher studying the psychological status of other conspicuous groups such as the unemployed (who some may think of as lazy and who may lie in order to enhance the likelihood of receiving benefits). Such stereotypes are not useful in this sort of research, unless one is studying the formation of these stereotypes or what basis in fact exists for the stereotypes. If one accepts that the process of carrying out research is to learn within an informed context, then to doubt what one is learning because of pre-existing biases invalidates the process. Specifically with regard to the study of recovery from injury within this sample of police officers, these sorts of stereotypical issues are less relevant than if one were researching the perception of and practices of the police in the community.

In presenting the research to the officers, it was emphasised that the research was supported by their employee association (the Scottish Police Federation) and being carried out independently by the Department of Psychology at Glasgow University. At the outset, an article was included in the employee newspaper, the 'Newsbeat', which described the researcher and the purpose of the research. (Appendix GG presents a copy of this

article, as well as the letters which accompanied any contact with the officers). It is gratifying that in the two studies in which personal verbal contact could be made with the potential subjects that a one hundred percent response rate was achieved, and this emphasises the importance and effectiveness of personal contact with the officers. In the cross sectional study, personal contact was not possible with the consequence that a 60% response rate was achieved.

3.9 Conclusions. The initial purpose in selecting police officers for study was to obtain a group who were demographically similar and from whom, because of the size of the work force, a cohort of injured subjects could be obtained relatively easily. In the course of carrying out this thesis many other possible topics for study became evident. this population presents an ideal one in which to study such issues as the relationship between perceived control and stress (Fisher, 1986). She proposes that a sense of perceived control over outcomes is essential for mental health. It would appear that the hierarchical structure of the police create a working environment in which there is reduced personal control. Specifically, a study of the health correlates and consequences of both the transfer system and the disciplinary inquiry system would be interesting; officers tend to deal with these events with either anxiety or anger. It would be of value to find if the relationship among the cognitive appraisal of the event, the overt behaviour, the affective response and the ill health outcomes. The perception of alcohol as psychotropic medication is also interesting; particularly in Glasgow, people tend to regard alcohol as an important cultural element and an appropriate way to 'unwind'. The difficulty in this particular working context is there are so many acute or chronic stressors that it is likely the use of alcohol as a medication could easily become habitual. In addition, of course, while carrying out the injury study, the Lockerbie disaster occurred. The research that was carried out on that subject is reported in Chapter 8.

Chapter 4: The Psychosocial Measures.

Abstract. This Chapter presents the psychosocial measures which were applied in all three empirical studies. The measures are classified as those to do with affective state, life events, variables to do with work, measures of causal attributions, social support and management of time. The measures were drawn from previous research in the study of life events, and the study of the affective response to unemployment.

4.1 Introduction. This Chapter describes the psychosocial measures which were used in the cross sectional study and in the two prospective studies. Some were used in all three, for example, the Hospital Anxiety and Depression Scale (HAD, Zigmond and Snaith, 1983) and Brewin's measure of culpability and causal responsibility (Brewin et al., 1983). Others were unique to one study in particular. There are common themes of measurement throughout the empirical investigation and, to avoid repetition, this Chapter has been devoted to describing the measures. The rationale for selecting particular variables is included in each empirical Chapter (5, 7 and 9).

The measures are grouped as follows: measures of affective state (Section 4.2); the index of threatening life events (Section 4.3); measures of work satisfaction and other variables pertaining to work (Section 4.4); the measure of culpability and causal responsibility (Section 4.5); measures of social support, and relations at home and at work (Section 4.6); the measure of time management (Section 4.7).

Some other questions were included in the questionnaire or the interview but were not included in the inferential analysis. Throughout the thesis there is reference to these questions, for example, that about sources of dissatisfaction in the job (Table 3.4.1). Items of this sort are dealt with in various sections of the thesis as they are relevant, to provide substantiation for a point being made.

4.2 Affective state. The Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983) is a self assessment measure which was standardised on a hospital outpatient population. It is intended to detect psychological disorder (depression and anxiety) in a normal population rather than a psychiatric clinical population. It was used by Alexander et al. (1991) to assess psychological disorder in Grampian police officers and by MacKinlay and Brooks (1990) to assess psychological disorder in Lockerbie adult survivors. The wording of the HADS is easily understood, and was used in all three empirical investigations in the thesis.

The alternative instrument of this type is the General Health Questionnaire (GHQ, Goldberg, 1973). The twelve item version of the General Health Questionnaire was used in the Sheffield Applied Psychology Unit studies of unemployment (Warr and Jackson, 1985). It has also been used in several studies considering the affective state of normal populations in abnormal circumstances, for example, studies of police officers' reactions to demanding duty (Mitchell and McLay, 1990; Thompson, 1991; Duckworth, 1986).

The results from using both instruments in the cross sectional study, and then in the first prospective study indicated that although correlated (see Appendix M) each instrument may be sensitive to rather different aspects of psychological functioning in this normal population. The instruments are considered by researchers to be fundamentally of the same type, and generally one or other is opted for. At the outset, the author was unfamiliar with the particular population of police officers so it was not immediately obvious which instrument would be the better to use.

Chapter 5 describes that the General Health Questionnaire appeared to be sensitive to the temporary changes in affect brought about by convalescence, and that the HADS did not reflect these changes to the same degree. Both were again applied in the first prospective study (Chapter 7) since the purpose of that investigation was quite different, to measure any relationship between affective state at the beginning of convalescence and the outcome of recovery rate. On this basis,

a measure of more usual functioning was required which suggests that the Hospital Anxiety and Depression Scale would be better. This point is explained below.

The two instruments are worded in slightly different ways, and this might account for the difference in sensitivity. The General Health Questionnaire asks the respondent to carry out a comparative exercise, and to think how he or she feels 'now' or 'recently' compared with how he or she feels 'usually'. Items such as 'Have you felt constantly under strain' are rated by the respondent on a four point scale. The response alternatives vary to fit the meaning of the item but are of the form, 'not at all'; 'no more than usual'; 'rather more than usual' and 'much more than usual'. The Hospital Anxiety and Depression Scale does not require this comparison to be made and, by this argument, the HADS may be a better measure of the person's usual state and so better for predictive purposes. For this reason the General Health Questionnaire was not used in the second prospective study.

A further explanation might be in terms of the wording of the General Health Questionnaire in that it might have produced defensive responses in the officers. Answering in the affirmative to such items as, 'been thinking of yourself as a worthless person' (GHQ) may be rather less likely than to 'I (don't) look forward with enjoyment to things' (HADS), both of which are reflective of depressed affect. In a different context in measuring the impact of trauma on a normal sample operating in abnormal circumstances, its use in the Lockerbie research (Chapter 8) produced little difference in mean levels of psychological disorder between the officers who carried out the more or less threatening tasks at the site; which differences were reflected in their acknowledging physical symptoms and intrusive ideation. Paton (1991, *private communication)* found that nurses exposed to traumatic duties acknowledged an impact as measured by the impact of Events Scale (Horowitz et al. 1979) but did not acknowledge commensurate psychological distress when their level of functioning was assessed before and then after the work. This result was explained by Paton in terms of the wording of the items, that the nurses would not wish to acknowledge

psychological disorder as a result of their work, but were more comfortable with acknowledging that the work had been significantly 'upsetting'.

In the cross sectional study to find out more about the phenomenology of being off work, the List of Perceived Problems was included (Payne and Hartley, 1987). The instrument was developed from interviews with the unemployed to quantify the sorts of worries and concerns which the unemployed experience. Of the original eighteen items in the list, only five were included, and these were to do with expectations of the future, use of time and relations within the family. Participants are asked to rate the magnitude of particular worries 'just now' as being a 'big problem'; a 'middling problem'; a 'small problem' or 'no problem' (scored '3' to '0'). This measure was used only in the cross sectional component of the research.

4.3 Index of threatening life events. Threatening life events have been demonstrated to have a significant impact on an individual's psychological functioning, originally by Holmes and Rahe (1967), by Paykel and Uhlenhuth (1972) and by Brown and Harris (1978).

An index of threatening life events was included in all three studies to control for the effect of life events in measuring recovery from injury. In order to make it clear what was meant by a threatening life event, a list of the Ten Most Threatening Events (Brugha et al., 1985) was presented. For police officers, undergoing a disciplinary inquiry is particularly threatening and was included in the list. Officers were asked to indicate if any one of these or anything similarly unpleasant or threatening had happened to them over the previous year. The usual method of measuring the incidence and contextual threat of life events is by interview. Costello and Devins (1988) investigated the feasibility of a questionnaire approach to accurately record the incidence of events and found little difference between the data achieved by the very time consuming interview method and that from a screening questionnaire. For the present purposes only events and chronic difficulties which were significantly threatening (coded '1' or '2' according the the Brown and Harris

Dictionary of Life Events) were included in the analyses. In view of this only limited information about each event was required. A contextual threat rating was established for each life event by a mutually agreed rating by the author and Professor Keith Oatley, and the responses converted to a categorical variable: those which were rated high in long term threat were sent to Tirril Harris who confirmed their correct coding. The categorical variable was converted to a dummy variable (Dunn and Clark, 1987) for the purposes of regression analysis.

4.4 Work satisfaction; and other variables pertaining to work. According to the literature, job dissatisfaction is an important determinant of time off work after an injury. The variable may, however, not be as important as is suspected and the correlations with recovery rate that have been established are low (Brewin et al., 1983; Allodi and Montgomery, 1979). Despite these low correlations, job dissatisfaction remains a likely predictor of time off work and, indeed, it makes intuitive sense that if a person is dissatisfied with their work, they will tend to stay away from it for as long as possible. Two different measures of job satisfaction were used: that in the first study was developed for use with accident victims in the study by Brewin et al. (1983; Brewin, 1984). This measure was applied in the cross sectional study and in the first prospective study. It asks the respondent to rate seven separate aspects of the job (type of work; physical work conditions; workmates; rate of pay; hours of work; supervisor; and considering every aspect). Each of these are rated on a four point scale from 'very satisfied' to 'very dissatisfied' and the scores added to produce a total measure of job satisfaction. By this measure, the general level of satisfaction was high: 80% and above of the sample (66 out of the total sample of 82) rated themselves as satisfied or very satisfied with all the items other than the hours of work, with which only 50% of the sample were satisfied. This instrument was quite simple, in a sense, and may not have reflected the more subtle aspects of what people like or do not like about their jobs. The percentages given above show that there was very little variation in the responses which diminishes the utility of any variable for predictive purposes.

In view of these possible problems a more detailed measure of work satisfaction was used (Warr et al., 1979). A component of the Work and Life Attitudes Survey developed by Warr et al. (1979) was a scale measuring job satisfaction. In this respondents are asked to rate sixteen aspects of their job on a seven point scale producing a summed score. The variation in response was better using this instrument. The proportion of subjects (n = 52) in the second prospective study who were moderately satisfied to extremely satisfied with particular aspects of their work is shown in the last Chapter (Table 3.4.2) in the discussion of sources of dissatisfaction among the officers. It was thought that this instrument, which was administered by interview, was superior to that used in the first prospective study in terms of the possible range of responses and the variation in aspects of work which were asked about.

Other aspects of the officer's job were thought to be relevant to length of absence from work after injury. Some of these are based conceptually on research carried out on the unemployed (Fryer, 1988). Two further aspects about work were included in the interview (second prospective study). The first of these was a measure of 'work commitment' (Jackson et al., 1983) which is aimed at assessing the degree to which the person is attached to work in general. The concept behind the measure is that a person who is highly attached to the work force can be expected to be more severely affected by job loss than a person for whom work is less central. Work commitment has been systematically researched with the employed and the unemployed and, despite the obviousness of some of the items, (for example, 'Even if I won a great deal of money on the pools I would continue to work somewhere'), is found to be a reliable measure of this factor. There are six statements about 'work in general' with which the respondent agrees or disagrees on a scale of 1 to 7, the responses are then summed to produce a total index of the degree to which the person is attached to regular work. Similarly, in the present research context, a person who is away from work through convalescing from injury but for whom to work is a central and important issue, may be more adversely affected.

An hypothesised reason for psychological distress during unemployment is that the person is deprived of the usual rewards of work. Jahoda (1981) has postulated that aside from the manifest function of work which is to earn a living, there are, in addition, five 'latent functions' of work. These are described as:

1. The imposition of a time structure on the working day.
2. Regular shared experience and contact outside of the nuclear family.
3. The linking of individuals to goals and purposes which transcends their own and implies the interdependence of human beings.
4. The definition of aspects of personal status and identity associated with work.
5. Activity is enforced, and work answers the strong need to experience the consequences of one's deliberate actions, the daily exercise of competence and skill.

From these descriptors of the latent functions, six categorical variables were generated (see Appendix F). These were: the time structure imposed on the day; social contact outside of family with colleagues; social contact outside of family with the public; enforced activity of having something to do; goals other than personal ones; identity (and status) as a police officer. The social contact category was divided into two: contact outside of the family with colleagues and contact outside the family with members of the public. This was thought necessary in view of the nature of a police officer's job which involves daily contact with colleagues, as well as constant contact with the public. To reflect these latent functions, the officers were asked in the interview whether there were any aspects of the job that they missed since they had been off work (even for a relatively short time). Some responded that they did not miss 'yet' implying that they had not been away from work so long as to start missing anything about it. This measure generated categorical variables.

4.5 Causal attributions. The causal explanations which accident victims make about the circumstances in which they were injured has an influence on a

variety of outcomes (Brewin et al. 1983; Brewin, 1984; Bulman and Wortman, 1977). By factor analysis of a number of attributional statements, Brewin had identified two dimensions of causality: causal responsibility and culpability and devised an eight item scale to measure the internality or externality of these dimensions (Appendix F). This scale distinguishes between a perception of blameworthiness for an event (culpability) which includes a moral component, and causal responsibility, a perception of someone or something having caused an event. This scale was used in all three studies, although in the cross sectional study it was applied only to find whether the wording was comprehended by this sample of police officers. Four items apply to culpability and four to causality and they are presented in mixed order.

4.6 Social support, social relations at work and at home. Social support was considered in two aspects: Perceived *practical help* and perceived *emotional support.* Using a measure of 'supports' and 'constraints' developed by Payne and Hartley (1987) particular significant others, 'wife or partner', 'friends', 'workmates' and 'supervisor', were rated on a four point scale for their support over the past month and according to the degree to which they were seen as providing practical help and emotional support. The scale was as follows: 'very' (4); 'somewhat' (3); 'not at all' (2); 'made things more difficult' (1). In response to the question about 'wife or partner' there was very little variation in response. Eighty two percent of the sample rated their partners as being very helpful in practical ways, and seventy five percent rated their partner as emotionally supportive. There was no relationship between the reported level of support at home and the recovery rate. The low variability in response to this question reduced its usefulness, and the measure of social support from partner was not used in the regression analyses.

In view of this lack of variability, part of the interview (second study) included questions aimed at achieving a more sensitive measure of relations at home. The interviewees were asked to rate the degree of tension (see Appendix F) in the home. Six 'levels' were offered with definitions of what that level of tension

would imply behaviourally.

In a separate section, two items from the Payne and Hartley List of Perceived Problems (1987) were included: respondents were asked to rate how much of a problem it was to 'keep the family cheerful and contented' and to 'live up to other peoples' expectations'. The alternatives offered ranged from rating the item as a 'big problem' through a four point scale to 'no problem'. Again, the range of responses to this question was very limited. There were 42 subjects with partners and families who answered these questions, only 6 (15%) acknowledged that keeping the family cheerful and contented was even a small problem and 7 (17%) acknowledged that living up to others' expectations was small problem.

It was thought that the degree to which the officers felt their spouses to be supportive would influence the time taken to return to work, however, there was very little variation in perceived levels of support. Although several studies have found that social support is an important mediator in the effects of negative life events (Cohen and Willis, 1985; Gore, 1978), some other research this has not found this to be the case. For example, Payne and Hartley (1987) found that social support, measured by the number of contacts, did not moderate the negative effect of unemployment.

Possibly a more relevant source of social support for recovery time would be perceived social support from colleagues and supervisors at work. Using the same format of supports and constraints described above, the respondents were asked to rate the perceived emotional support and practical help from colleagues and supervisors. These were added to produce a composite measure of work social support used in the first prospective study. Table 4.6.1 shows the intercorrelations of the ratings of social support at work.

Table 4.6.1

Intercorrelations of ratings of social support at work

	Colhelp*	Colemo	Suphelp	Supemo
Colhelp	1			
Colemo	.563	1		
Suphelp	.522	.256	1	
Supemo	.507	.636	.669	1

* The variable names refer to practical help and emotional support from colleagues and supervisors

4.7 Time Management. The application of this measure was again based on research carried out with the unemployed. It was hypothesised by Bolton (1984), that the ability to manage time in the absence of the structure of work is a personality dimension which could predict psychological distress during unemployment. The Bolton Time Management Questionnaire (Bolton and Oatley, 1985) is a scale with five factors comprising thirteen statements to do with mastery over time (see Appendix F). These scales were derived factor analytically from four other scales designed to measure different aspects of time management and the development of the instrument is described in detail elsewhere (Bolton, 1984). Five factors emerged in Bolton's analysis: 'self-motivation'; 'ease with time'; 'mastery over time'; 'regularity of rising' and 'predictability of the future'.

In the Time Management Questionnaire, which was administered by interview in the second prospective study, the respondent is required to agree or disagree on a seven point scale with such statements as, 'I find it difficult to get things done without deadlines' or 'I have difficulty filling time'. It was included in the present research as a measure of the dependence the convalescent might have on the external structure of work.

4.8 Conclusions: This Chapter has described the measures used in the empirical investigations in the thesis. Data were collected in both the cross-sectional study and the first prospective study by a self completion questionnaire, while an interview was used in the second prospective study. The aim of the second study was to measure with more precision some of the same groups of variables found relevant in the first.

Chapter Five: The Cross Sectional Study

Abstract: Malingering might be suspected if people who are at home recovering from injury are generally more satisfied and happy than their fellows at work. This was assessed by comparing levels of psychological symptoms reported by a group of convalescing police officers and a group of working officers. The main hypothesis of the study, which was confirmed, was contrary to the notion of malingering in that convalescing officers acknowledged significantly higher levels of psychological distress. Moreover there was a significant association between the level of symptoms and the length of convalescence, such that the longer an officer was off work the more psychological distress was reported. The findings from the present analysis do not support the idea that convalescing is preferable to working. In terms of the level of psychological symptoms there was little evidence that the officers were enjoying themselves and wished to be off work.

5.1 Introduction: This chapter describes a cross sectional study which compared the affective state of two groups of police officers. The thrust of some of the literature reviewed in Chapters 1 and 2 would lead to the expectation that those who are convalescing would be in a better psychological state than those who were working. It was, however, the hypothesis of the study that officers who were at home convalescing would report higher levels of psychological distress than fellow officers who were working. Fryer (1988) in reviewing research on the unemployed notes the consistent finding of elevated scores on the General Health Questionnaire (Goldberg, 1972) in that group compared with general population norms. The reasons proposed for this psychological distress are to do with the person being deprived of the sorts of other rewards (apart from remuneration) that are associated with working (Jahoda, 1972). Bolton (1984) in her longitudinal study of depression in unemployed men found that the unemployed sample, interviewed six to eight months following the redundancy, had significantly higher scores on the Beck Depression Inventory than an employed working sample. Apart from the associated economic and social problems, simply the lack of time structure

is a significant psychological problem among the unemployed (Bolton and Oatley, 1985). It seemed reasonable, that if a person who is even temporarily without work can become distressed (Fryer and McKenna, 1987) then so too could the convalescent for the same reasons.

There is also an observed increase in psychological symptoms with the passage of time. Warr (1983), in a study of 954 unemployed people found a strong association between *duration* of unemployment and scores on the General Health Questionnaire. Warr's study was cross sectional and could not address the issue of whether it was the event of job loss or the experience of unemployment which produced this distressing effect. This sort of circularity is evident in some literature on convalescence (see Romano and Turner, 1985) It was proposed in the present study that psychological distress would increase commensurate with the length of time the person had been off work, recovering.

In the same way that the unemployed person is deprived of feelings of effectiveness and control over his or her life, the convalescent person is at least temporarily in a passive role. The nature of the health care delivery system is such that the patient must wait for appointments or consultations. The temporary incapacity brought about by a broken limb might mean being dependent upon others to carry out tasks, and an inability to feel good about oneself through being effective and competent at work. This seems similar to the deprivation experienced by the unemployed. Fryer (1986) defines 'agency' as that aspect of people, in fact a need in people, to assert themselves and to initiate and influence events. The inability to act as an effective person is one explanation for the distress of unemployment, and could also characterise recovery from injury when one does not know what the outcome is going to be, or at least only has an approximate idea of when a return to work will be possible. These factors, along with the escalating sense of uselessness brought about by inactivity and absence from work explain such psychological distress. On this basis the following hypotheses were generated.

Hypothesis 1. Working officers will acknowledge fewer psychological symptoms than officers who are at home convalescing after an injury.

Hypothesis 2. There is an association between length of absence and the level of psychological distress.

5.2 Method. The plan was to compare a working group of officers with a group of officers who were convalescing from injury, in terms of their level of psychological distress. Records are kept at the medical department of all officers who are absent through injury or ill health at any one point in time. A sample of officers who were absent from work because of injury was obtained from this source and they were contacted by mail. Others were obtained from those attending the Chief Medical Officer for a review of their medical situation (if an officer is absent from work for approximately two months, he or she would be called in for a review by the Chief Medical Officer). A comparison group was obtained from the employee records. The criterion for inclusion in the comparison group was that they had not been absent from work through ill health or injury for a longer period that seven days in the previous six months or longer than 14 days in the previous year. They were obtained by selecting that officer with the sequential registration number (indicating the time of joining the police) next to one of the injured officers in the sample. In this way a sample of working officers closely matched for age and length of service was obtained.

5.3 Subjects. The working sample (n = 25) and the convalescing sample (n = 44) were comparable in terms of their job, working conditions, sex and age (35 years).

All the convalescent group, except for two officers who were subsequently discharged on medical grounds, returned to their jobs.In this sample, the lengths of absence for those who did resume their duties ranged from 22 to 312 days (a mean

of 123 days). The injuries sustained by this group were heterogeneous in terms of site and type, but were broadly similar in that none was clinically very serious, in the sense of being life threatening, and all were common injuries. Table 5.3.2 presents the types and sites of injury in the sample.

Those who had sustained upper limb injuries, on average, were absent from work for the shortest period of time (109 days) while multiple injuries resulted in the longest absences (173 days).

Table 5.3.2
Number of subjects with injuries of different types and sites.

	Upper limb	Lower limb	Knee	Back	Multiple	*Total*
Fracture	7	7	1	0	0	15
Strain	1	4	9	8	0	22
Laceration	0	2	0	0	0	2
Contusion	0	0	1	1	0	2
Multiple	0	0	0	0	3	3
Total	**8**	**13**	**11**	**9**	**3**	**44**

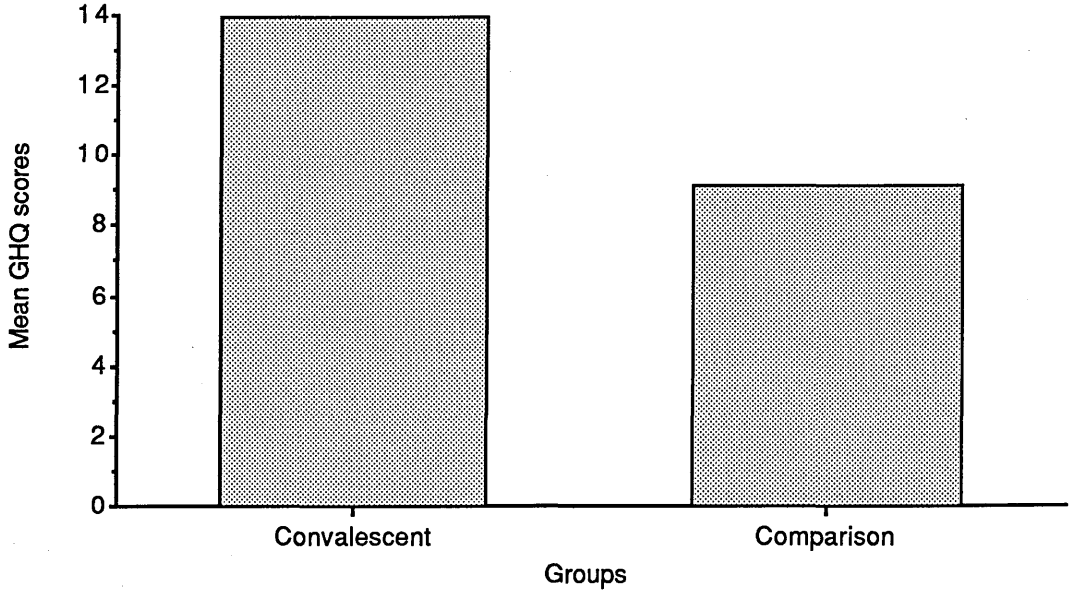
5.4 The measures. A questionnaire was designed for the purpose including the following measures, and a parallel version was adapted to exclude the questions on injury and convalescence (Appendix B). Two measures of psychological symptoms were applied, the General Health Questionnaire (Goldberg, 1972) and the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983). Both were thought to be suitable for this sample. The List of Perceived Problems was included to provide a further measure of the experience of convalescence. Since there are many reasons for and correlates of psychological distress, an index of threatening life events experienced over the previous 12 months was included, as was a measure of job satisfaction (Brewin et al., 1983). These measures are described in Chapter 4.

5.5 Results. A comparison of means test (*t* test - two tail) was carried out on the General Health Questionnaire scores and the Hospital Anxiety and Depression Scale scores. The convalescents, who were assessed a mean of 72 days after the injury, reported significantly higher levels of psychological distress ($t = 3.40$; $p = .0012$) than the working officers (Figure 5.5.1). The Hospital Anxiety and Depression Scale did not discriminate between the convalescent group and the working group: ($t = .48$; p = ns) on the anxiety scale, nor on the depression scale ($t = 1.17$; p = ns). Possible reasons for the difference between the results obtained using the two instruments are discussed later.

The finding allows the first hypothesis of the study to be confirmed, that convalescents report significantly higher levels of psychological distress than working officers.

Figure 5.5.1

Mean GHQ-12 scores of the convalescent and working groups.



There are many reasons why psychological symptoms can develop, and it is possible that the higher levels of psychological distress in the convalescent group might be the consequence of other factors such as recent threatening life events. Only life events which would have a long term threat rating of '1' or '2' (Brown and Harris, 1978) were considered. Eleven per cent (11%) of the convalescent sample had experienced such an event in the previous 12 months, compared with 20% of the working sample. This difference was not significant ($X2 = .96$; p = ns). Considering that some of the participants in the convalescent sample had been off work for up to 220 days, it is possible that convalescence may be protective against the occurrence of distressing work related events.

In terms of job satisfaction, overall the convalescents a higher degree of job satisfaction than did the working group. Only two aspects were rated significantly higher: 'type of work' ($p = .05$) and 'workmates' ($p = .03$). This suggests that those at home were perhaps missing the job role of being a police officer and were missing the camaraderie of fellow officers. Despite the higher rating of job satisfaction in the convalescent group, their scores on the measure of psychological distress were higher. From findings there is nothing to detract from an interpretation that it is convalescence and its sequelae which is distressing.

5.6 The association of length of absence with psychological distress. The subjects in the study had all been injured in different ways and to different degrees and had all been off work for different lengths of time at the time they were tested. A test of correlation was carried out to assess the association between the length of absence so far, and the level of reported psychological symptoms. A significant positive correlation was found between the level of psychological symptoms (GHQ) and length of absence at the time of testing ($r = .39$; $p = .008$). This finding confirms the second hypothesis that there is an association of psychological symptoms with length of absence.

As a further test of this, the sample was divided into those officers who had been absent from work for seven weeks or less and those who had been absent for 8 weeks or more. The level of psychological symptoms measured by the General Health Questionnaire was significantly higher in that group who had been off work for the longer time ($t = 1.98$; $p = .05$). Significant positive associations were, however, not found between the length of absence so far and the measure of anxiety ($r = .105$) and depression ($r = .250$) in the Hospital Anxiety and Depression Scale. The possible reasons for this were discussed in Chapter 4 (Section 2).

5.7 The phenomenology of convalescence. This study provided an opportunity to gain insight into the experience of convalescence by looking in more detail at individual items on the affective measures. The largest differences between the working and the convalescent groups were the items, 'playing a useful part' and being unable to 'enjoy usual activities' (items 3 and 7). Other items with higher mean scores in the convalescent sample were to do with cognitive difficulties: being (un)able to concentrate (item 1), feeling (in)capable of making decisions (item 4); possibly as a result of worrying about their job status in the police. Feeling (in)capable of decision making ($r = .38$) and being (un)able to concentrate ($r = .31$) also showed a positive association with the passage of time. All the relationships were significant at $p < .05$.

Thinking of oneself as a worthless person ($r = .30$) and losing confidence ($r = .27$) were both positively associated with length of absence. Diminished self confidence could be related to being apart from sources of positive regard and reward outside the family, and other secondary benefits of steady employment. At home the officers may be the brunt of critical comments by neighbours or less charitable relatives and friends, who believe that malingering is the problem. There are parallels between this progressive deterioration of psychological state and that observed in the unemployed.

A list of possible concerns to the convalescent was devised based on the List of Perceived Problems designed by Payne and Hartley (1987) to provide insight into the experience of unemployment. Two items which significantly distinguished between the working sample and the convalescent sample, were to do with the productive use of time: '(not) finding useful ways to spend time' (t = 4.65; p = .0001) and '(not) finding enjoyable things to do' (t = 2.66; p = .0098). In this cross sectional study it is not clear whether the physical restrictions that the convalescents experienced prevented their pursuing many interesting activities, or whether they found the lack of a time structure de-motivating. Clearly both boredom and aimlessness were problems for the convalescents. Items on this list which correlated with length of convalescence were about uncertainty in the future (r = .51), doubt about being able to do the job again (r = .64) and concern about losing job skills (r = .36). This suggests that the convalescents are worried about their future in the police, and it is reasonable to expect that the longer the officer is absent from work the more severe these worries become. Other positive associations with time were to do with finding useful ways to spend time, and 'hoping that the doctor knows what is wrong and hasn't missed something about my condition'.

The officers in this study had been away from work for a mean of 71 days at the time they were assessed. A sense of what it is like to convalesce was obtained from some informal interviews with other officers. Many said that being off work was 'driving them up the wall', becoming very bored with the enforced inactivity. They reported feeling socially isolated and quite out of touch with their stations; after some initial phone calls or visits from the station they felt forgotten. For many convalescing officers required attendance at court to give evidence is the only contact that they have with their work. There is a perception by officers that there should be more concerned contact from their offices, and that only to have contact for court purposes suggests an uncaring attitude by their supervisors. They also expressed considerable worry about what other people might think of their being off work. Two items on the list of worries reflected this concern: 'worrying

about what my supervisor thinks of my being off work like this' was significantly associated (.38) with the length of the convalescence so far, as was worry about what workmates might be thinking. All of these concerns may exacerbate the feelings of isolation which can characterise convalescence.

5.8 Conclusions. Although convalescence could conceivably be protective against the strains of work, in the present sample, this obtained little evidence in the present study. There was a relatively high incidence of life events in the working officers who responded which possibly suggests that they had particular problems which may have encouraged them to respond. Despite the greater number of life events in the working group, their mean level of psychological symptoms was lower than in the convalescent sample. These data simply serve to substantiate the view that despite these other potential sources of distress, the fact of convalescing seems to be distressing. If anything, the higher incidence of life events in the working group may mask an even larger difference between the two groups. The response rate to the mailed questionnaire for both the working and the convalescent was 60%, and there may be a bias in both groups. In comparing those who responded with the 40% who did not, it is clear that the non-responders were off work for a shorter period of time and so may have felt that the questionnaire was inappropriate to them: these subjects were off work for a mean period of 37 days at the time they were contacted, and had a mean total length of absence of only 60 days.

The findings generally run counter to the view that convalescence is enjoyable, and support the idea that it is psychologically distressing, requiring as it does that an otherwise healthy person remain substantially inactive. Clearly for a more definitive analysis of the phenomenology of convalescence a longitudinal analysis of convalecence carried out in the most inobtrusive way possible should be carried out. The application of this finding to practice would be to structure the recovery phase in such a way as to shift the emphasis from the patients' passively waiting for something to happen, and institute part time employment or modified duties until the person is fit to resume full employment.

Chapter 6: The Physical Measures

Abstract. The assessment of injury severity is a complex task, and one which is made more complicated if one is required to compare the relative severity of injuries which are anatomically quite different. A review of the various methods employed in previous research led to the conclusion that a method applicable to minor or moderate injuries needed to be developed. There are two highly relevant previous studies of injury recovery, that by Brewin et al. (1983) and that by Allodi and Montgomery (1979), and an elaboration of the method applied by these researchers was adopted in the present study. Its basis is a medically informed judgement of a likely and expected period of recovery after a particular injury, against which estimate the actual length of recovery is compared. An arithmetical transformation produces a fraction reflecting how much slower or how much faster than expected that the patient actually took to recover.

6.1 Introduction. Chapter Five described a cross sectional study designed to identify differences in affective state between officers who were convalescing after injury, and officers who were working. In that comparison, the severity of the injury was not taken into consideration, since the length of time that the officer had been off work at the time of assessment was the single independent variable of importance. In contrast, because the purpose of the longitudinal studies is different, injury severity has to be measured and included in the analyses. An assessment of influences on recovery time which are not 'physical' or 'clinical', and which are social or psychological, would be meaningless without having first taken account of how severely injured is the patient. This assumption is on the basis that the severity of the injury is the most important predictor of recovery time.

In previous studies, various methods of grading severity have been used. Some, like the Abbreviated Injury Scale, are highly reliable and valid, others are simple categories with such labels as 'minor' or 'severe' (Johns, 1981). These methods were considered in the review of the literature in Chapter 2. Woodyard

(1980a; 1980b) generated severity categories, but the method fell down because they were not judged independently to establish any external validity. Other studies use a more objective method based on estimates of reasonable recovery time made by medical practitioners. Allodi and Montgomery (1979) developed an outcome measure called 'recovery rate' based on a length of absence, independently estimated by the occupational health doctor, divided by the actual length of absence. Brewin et al. (1983) elaborating the method used by Allodi and Montgomery (1979) generated an outcome measure called 'adjusted recovery rate'. In their study, estimates of reasonable and expected recovery times were provided by two senior orthopaedic registrars. The mean estimates were divided by the actual length of absence for that individual, producing a fraction which represented how much longer or faster was the actual recovery time than that expected. A whole number and a fraction implies that the person had taken longer to return to work than expected, while a fraction less than one implies that the return to work had been faster than expected. This was the outcome measure used in this study.

The studies which use the Abbreviated Injury Scale (AIS) and the Injury Severity Score (ISS) were described in Chapter 2. The AIS and the ISS are rating systems based on measures that are objective and repeatable. The six categories in the AIS range from no injury through minor, moderate, serious, severe, critical and maximum, by which it is understood that the injury is virtually unsurvivable. As such, these scales distinguish between injuries which are grossly different in severity, so are not useful for the present purposes. As described in Chapter 2, the conclusion of the studies which depend on such scales is that even with a highly reliable measure of injury severity there is still an imperfect relationship between injury severity and a variety of different outcomes (McKenzie et al., 1986.; Galasko et al.,1986).

The injuries in the present studies required to be compared along one dimension, from minor to severe. The problem posed by such comparison is the dissimilarity of such injuries as a ligamentous strain of the ankle and a fractured arm. How can they be compared? What makes one injury 'severe' and another

'minor'? Much is implied by the question, 'How severely injured is the patient?', and consideration of what is implied provides insight into the complexities of estimating injury severity. Woodyard (1980b) states,

'In describing an injury, the word 'severe' may refer to the energy dissipated from external violence, the threat to life, the permanent impairment of physical or mental faculties leading to disability or lastly the treatment period required'.

In asking the question, one might want to know if the injury is life threatening, if there are multiple injuries, what treatment will be required, how long will the recovery take, what are the long term implications and will the person recover fully. There is an assumption on the part of the patient or the patients' relatives that the doctor will know the answer, but the reality of clinical medicine is that the answers to many of these questions must simply await the passage of time.

For the present study, three doctors were interviewed informally about what features or characteristics of an injury would suggest that it was more serious than another. A primary definition concerned the extent of the tissue damage. Other perceived correlates of severity were whether there was a potential for permanent disability; or the complexity of the treatment required. As an instance, a clinically minor injury would be one which, treated by a general practitioner and then by the patient him or herself, would not result in any permanent impairment. In contrast, to be clinically significant, an injury might require initial hospitalisation, surgery either immediately or later, and would result in an occupationally relevant permanent impairment. The pain experienced by the patient was proposed as another important way of deducing severity, but that this should be considered a factor is surprising. Being a subjective experience, pain is difficult to measure (Melzack and Wall, 1986); in addition, the literature often suggests that manifestation of pain through 'pain behaviour' is not a good way of assessing organic damage. If pain is to be measured it is not clear when it should be measured, whether right after the injury or at some later time during the convalescence. It is clear that the concept of injury severity is complex, and

encompasses many aspects of the initial insult as well as its subsequent rehabilitation.

6.2 Conceptual and practical difficulties in measuring injury severity. Since a physical examination is the basis for assessing injury severity one outstanding difficulty is to decide upon a particular time after the injury which best reflects the severity of the injury. This would be necessary to produce a uniform measure applicable to all the disparate injuries in the series. Had the series comprised very similar injuries, for example, knee strains or ankle fractures, a standard date could have reduced variation; but the present study sample included such dissimilar injuries as to make a uniform interval probably meaningless.

As a preliminary exercise and to gain some insight into the conceptual meaning of the word 'severity', a sample of doctors were allowed to generate as many categories as seemed warranted to distinguish one injury from another or to group similar injuries, using whatever criteria they wanted. They were told that the aim was to range the injuries from most to least severe and that they were to use their own concept of severity in this exercise, whatever that might be. This is similar to the category formation method developed by Mandler and Pearlstone (1966) and proceeded as follows. The doctors (subsequently called medical adjudicators), blind to the outcome of length of absence, were provided with cards on which were printed the site, type of lesion and mechanism of the injury. They were told that the eventual purpose of this exercise was to range the injuries from most to least severe. Three iterations of the task were carried out, one after the other, and at each stage in this process the injuries which comprised each category were noted. Some adjudicators generated only three categories and some generated nine categories. The number '1' was applied to the least severe category whether there were only two more or eight more categories. The scores so generated were ranked according to the largest number of categories generated by any of the judges, i.e. nine and these ranked scores were correlated with the length of absence. It was found that this correlation was remarkably similar to that which

was subsequently obtained between the mean estimates and length of absence, thereby rendering the mean estimates reliable by this other more conceptual criterion. The criteria on which the adjudicators were independently basing their judgements varied individually, but it would appear that whatever they were, the categorisation included a tacit consideration of their expectations of the patients' length of absence. This finding encouraged the use of the simpler mean estimates of recovery time since they are much easier to generate than this time consuming creation of categories from more to less severe.

One assumes that a more accurate or sophisticated instrument could be based on more anatomical or orthopaedic detail, such as that collected in the second study (Appendix J). It may be, however, that additional information is just *more* information rather than *essential* additional information and it may not increase accuracy in estimating severity and length of absence. Eiser and van der Pligt (1988) report from a study in a psychiatric setting that the sole effect of more diagnostic information was to increase the diagnostician's *confidence* in his or her judgement rather than its accuracy. In addition it was not clear, a priori, which among the possible anatomical features of the injury and its sequelae, would be the most important in terms of severity and the prediction of an appropriate length of absence. Finding this out could only be achieved through some method like rule induction by which various pieces of data would be selected by the inducer according to their ability to explain the variance in recovery time. Conceptually the method is similar to a regression equation.

It had been a plan in this study to include some such induction method in developing the instrument, but it became obvious that to do so was beyond the scope of this thesis, the development of an instrument of this type constituting a complete study in itself. A very simple preliminary analysis included the type of injury in a regression analysis. Whether the injury was a fracture or a sprain was converted to a dummy variable and regressed on the outcome of recovery time, the resultant R^2 was .006 (p = .52). When an attempt was also made using categories of upper and lower limb injuries the R^2 was .003 (p = .76). These

non-significant relationships underline the inherent difficulty of embarking on such a project with a series of injuries which were all so different from each other. Too many gross sources of variation make no one particular anatomical measure equally relevant to each injury. To be specific, one of the more detailed measures obtained was whether there was restriction in the range of movement in an injured joint or an adjacent joint. Taking this example, it is easily understood that the functional implications to a knee and to a finger joint of a 50% reduction in range of movement are quite different. The fact that such a method was even thought about for this thesis indicates a lack of understanding of the complexities involved, rather than any likelihood that it was possible. The conceptual and practical difficulties encountered in trying to develop a more sophisticated instrument led to reliance on the more simple method of estimating recovery time and producing an adjusted recovery rate, which is described in the next section.

6.3 The use of estimates of recovery time and the generation of an adjusted recovery rate to account for injury severity. From the informal interviews with the doctors it was obvious that not only was the definition of injury severity complex, but that its measurement in a reliable and valid way was also complicated. Whatever method was chosen would need to produce integer data for the regression analyses planned in this study. In addition, for the purposes of the research an easily generated measure that would be applicable to many different types of injuries was required. It was decided that a method similar to that used in the previous research (Brewin et al., 1983; Allodi and Montgomery, 1979) should be adopted. This method depends upon the opinions of doctors of how long it would normally take a person to recover from a particular injury. These estimates met the criteria of ease of data generation, and they produced data that was in the required format. The method was also conceptually simple.

Although doctors are frequently asked by employers or patients how long functional recovery will take, the task of estimating recovery time is difficult for reasons which will be explained in Section 6.4 Data for these estimates were based

on clinical examinations and physical interviews with the injured officers which were conducted a mean of 12 days following the injury. There was agreement among the medical adjudicators and any orthopaedic specialists who were consulted that to delay the examination for at least a week post injury would be more reliable, and more informative. Among reasons for this delay were so that clinical complications and pain could settle; the first ten or so days post injury is a time of clinical flux when complications are most likely to occur, such as sepsis or embolism, or the manifestation of previously unnoticed fractures.

The clinical pro-forma used in the two longitudinal studies are reproduced in the Appendix (I and J). The first of these was designed with the assistance of the Chief Medical Officer. That used in the second study also benefited from refinements suggested by a Chartered Physiotherapist. In the second study, an extended clinical history was added to include such items as restrictions in the activities of daily living, the ergonomic requirements of the job, and questions about smoking and alcohol consumption. For reasons which will be explained below, none of the additional orthopaedic detail generated in the examinations, for example, measures of range of movement, or weight bearing, was subsequently used.

The rule applied was that physical examination of a limb immobilised in plaster examination would yield little more information than that gained from the officer him or herself. This was on the basis that he or she would have a good idea of the diagnosis from the information with which the patient was provided when the plaster was applied. A check on the accuracy of the information was made by asking details about the location of the fracture, the type of plaster, and at what site there was any pain. This allowed validation of the diagnosis against other information. As a further check, the site and type of lesion of all the injuries in the first study were subsequently confirmed by telephone with the officer some weeks after he or she had returned to work. These were carried out independently by the nursing sister hired for the second prospective study. Soft tissue injuries (contusions, lacerations, abrasions) and ligament or muscle strains, on the other

hand, were examined and arrangements were made to examine the officer at his or her home or at Headquarters.

When the adjudicators were asked to make their estimates of recovery time, to control the information upon which they were basing their decisions, very limited information was presented. This 'pared down' information consisted in the site of the injury, the type of lesion and the mechanism of the injury. The specific instructions which were given for each series, as well as the data presented to the adjudicators, appear in the Appendix (C). The only other information they were given was the age group of the subjects and that they were all police officers, mostly active constables on foot or mobile patrol.

The particular information that was chosen to present to the medical adjudicators was based on advice from a Consultant in Accident and Emergency Medicine (Mr Ian Anderson of the Victoria General Hospital, Glasgow). He explained that an injury can be defined by two factors: its site and type. In assessing its severity, in addition, it is important to know the mechanism of the injury, that is the force or velocity involved in the trauma.

In taking the example of an ankle injury, in which quite different damage can result depending on the mechanism of the injury (Duckworth, 1980), the basic principle is that the greater the violence, the greater the damage in terms of displacement of bones and tissues. Most ankle injuries are caused when the foot becomes fixed, and the weight of the person falling applies force to the joint. The injury known by the lay term 'going over on the ankle' can result from eversion or inversion, when the foot is turned away from or towards the body's mid line. As the degree of violence increases, the amount of disruption caused to the structures around the joint is likely also to increase, as is the chance of a fracture. Rotational forces may, in turn, cause ligament damage, a spiral fracture of the lateral malleolus (diagrams of the location of bones in the skeleton are included in Appendix L) or of the shaft of the fibula, or even a fracture of the talus. In terms of limb injury, vertical compression as a consequence of landing on one's feet from a height, leads

to the most severe damage. Examples within the study included fractures of the os calcis, or heel bone, which are notorious for the length of recovery time required. It can be seen that the mechanism of individual injuries is extremely important in determining the complexity and severity of the injury. For that reason and in the absence of radiological information, it was important that the medical adjudicators were aware of this detail. The limited information that was provided proved sufficient to allow quite acceptable estimates of recovery time.

Testing the external validity of the estimates proved to be somewhat of a tautological problem since their accuracy can only be tested by reference to the actual length of recovery. The main hypothesis of this study is that recovery time is influenced by several factors, not only clinical severity and, if this hypothesis is correct, estimates of recovery time could never correlate perfectly with the actual recovery time. This same problem was encountered in those studies reviewed in Chapter 2 (Section 3) which examine the external validity of standard scales to measure injury severity (the AIS and the ISS). In attempting to relate the quantification of injury severity to a number of different outcomes, for example, length of hospital stay, eventual permanent disability, it was found that there was variation not completely related to the quantum of injury severity. This variation was ascribed to the other non-clinical factors which might influence recovery time.

In the first study, nine medical adjudicators were asked to estimate recovery time for the 82 injuries in that series. These individuals were: a Consultant in Accident and Emergency, a family practitioner who taught family practice at Glasgow University, two Accident and Emergency Senior House Officers, one Accident and Emergency Registrar, one nursing sister and three Occupational Health doctors. The individual estimates, the mean estimates and the correlation of these estimates with the actual length of recovery and with each other estimate are presented in Appendix N. Correlations among the estimates indicate that the medical adjudicators mutually agreed about the relative severity of the injuries, although there is less agreement about the actual length of absence appropriate to

particular injuries. The three medical adjudicators whose estimates correlated most highly with the length of absence were selected on that basis. Table 6.3.1 presents the correlations of the adjudicators estimates with length of absence and with each other.

Table 6.3.1

Intercorrelations of adjudicators' estimates with each others' estimates and with length of absence (first prospective study n = 82)

	Adj 4	Adj 5	Adj 9	LOA
Adj 4	1			
Adj 5	.719	1		
Adj 9	.539	.689	1	
LOA	.488	.436	.416	1

An intra-rater reliability check was performed eighteen months later for the three best estimators, presented with the same list of 82 injuries: the correlations of the first estimates with their own second estimates were .719, .773 and .850.

A further reason for these three adjudicators to be selected was that they had the greatest familiarity with the population. They were the Chief Medical Officer, the Assistant to the Chief Medical Officer and the Medical Department nursing sister. These individuals could not have been influenced or had superior knowledge at the time they made their estimates, since there was a long time lag between the occurrence of the injury and any routine examination within the Medical Department. In the case of the nursing sister who had carried out the physical examinations of the injuries in the first series, there was a time lag of over a year between these examinations and her being asked to make an estimate of recovery time. In addition, insufficient information was provided to indicate which

of the hundreds of police officers seen in the Medical Department was being described in the list of injuries in the research.

A Chi square test (X^2) which assesses the dependence or contingency of one classification on another was applied to these data, which were divided according to a median split of length of absence, and a median split of the mean estimates of recovery time. This produced a 'short absence' (absent for 56 days or 8 weeks) and 'long absence' (57 days and over or nine weeks and over) category. It also produced a 'lower estimate', and a 'higher estimate' category comprising those injuries estimated to take up to seven weeks to recover, and eight weeks and over, respectively. The results indicated that there was significant dependence of one category on another, that is that subjects who were estimated by the medical adjudicators as likely to be off for longer were actually off for a longer period ($X^2 = 9.5, p = .002$). Table 6.3.2 shows the number of subjects in each cell.

Table 6.3.2

Contingency table comparing estimated length of absence with actual length of absence (second prospective study)

	Shorter 'actual' absence	**Longer 'actual' absence**
Shorter 'estimated' absence	29	13
Longer 'estimated' absence	14	26

This analysis shows that the estimates provided by the medical adjudicators are distinguishing satisfactorily between those subjects who stayed off work longer from those who stayed off work for a shorter time. It also shows that, in accordance with the thrust of this thesis, there is an imperfect relationship between the likely length of absence and the actual length of absence. Of research interest are the two sub groups: those with less severe injuries and a longer absence (n = 13) and the converse of this configuration, those rated as having more severe

injuries and a shorter absence (n = 14). Finding the possible reasons why these misclassifications emerge is the aim of the thesis.

Another way of assessing how good the adjudicators are at estimating recovery time is to compare their performance with that of the adjudicators used by Brewin et al. in their study (1983). Two senior registrars in orthopaedics provided estimates of likely recovery times based on the same information as was provided in this study. Namely, a description of the injury in terms of its site and type, the age of the patient, and the job title. The mean of these estimates applied in that study produced an R^2 of .380 (Brewin, *private communication*) in regression analysis with length of absence as the outcome. This figure can be compared with the present study: an R^2 of .260 was obtained for the series of injuries in the first study (Chapter 7) and an R^2 of .265 was obtained for the series in the second study (Chapter 9). In terms of the total amount of variance accounted for, this finding compares well with other related studies, but it would appear from these figures that the registrars in the study by Brewin et al. were rather better at estimating and hence at explaining the variance in recovery time due to injury severity. This difference in apparent skill is explained by the following considerations. All the patients in that study attended the same fracture clinic, which provided uniformity of treatment. This was far from the circumstances of the cases studied in this thesis, who attended different hospitals in and around Glasgow, which introduced a source of uncontrolled variation in the present study. Important aspects of treatment which would be uniform in the same hospital, and which are directly relevant for the length of recovery, would include the period of time the cast was kept on, whether and when physiotherapy treatment was started and at what time after injury the treating doctor (in his or her judgement) advised a return to work.

A very important additional factor in the study by Brewin et al. was that some of the subjects were being treated as patients by the registrars making the estimates (Brewin, *personal communication*). To safeguard against their having

prior or superior knowledge, they were advised to ignore what they knew about the patients, but it is very unlikely that they could or would have done so in trying to make a reasonable judgement. When the doctors in the present thesis carried out the equivalent exercise there was an element of competitiveness, even although they did not actually do it together, and even competitiveness with themselves to produce good or the best estimates. There is every reason to expect that the registrars in the study by Brewin et al. would have felt the same way and would have used every piece of information available to them.

In the second study, the same method was followed for the 52 injuries in that series. In addition to the three 'best' adjudicators who were used in the previous study, however, the other adjudicators were medical officers working with various constabularies around Britain. The individual estimates, the mean estimates and the correlation of these estimates with the actual length of recovery and with each others' estimates are presented in Appendix O. Again, the three medical adjudicators whose estimates correlated most highly with length of absence were selected. Two of the previous 'best' adjudicators and one of the Chief Medical Officers from another force were selected on this basis. These are presented in Table 6.3.3

Table 6.3.3

Intercorrelations of adjudicators' estimates with each others' estimates and with length of absence

(second prospective study n = 52)

	Adj 4	Adj 6	Adj 8	LOA
Adj 4	1			
Adj 6	.467	1		
Adj 8	.517	.739	1	
LOA	.368	.354	.515	1

That these estimates successfully distinguished between the subjects for different lengths of time off work was tested by a Chi square test (X^2) according to the same procedure described above. The results indicated that there was significant dependence of one category on another, that is that subjects who were estimated by the medical adjudicators as likely to be off for longer were actually off for a longer period ($X^2 = 13.9, p = .0002$). Table 6.3.4 shows the number of subjects in each cell.

Table 6.3.4

Contingency table comparing estimated length of absence with actual length of absence (second prospective study)

	Shorter 'actual' absence	Longer 'actual' absence
Shorter 'estimated' absence	22	7
Longer 'estimated' absence	5	18

This analysis shows that the estimates provided by the medical adjudicators are distinguishing quite satisfactorily between those subjects who are staying off work longer from those who are staying off work for a shorter time. In this data set, the two sub groups those with less severe injuries and a longer absence (n = 5) and the converse of this configuration, those rated as having more severe injuries and a shorter absence (n = 7) are of interest.

Accuracy of prediction of recovery time increases greatly if the adjudicator is able to examine the patient. This was made very clear in an exercise carried out in the second study. In that study, the examiner was asked to make an estimate of recovery time, after she had examined the officer. These data are available for 45 of the subjects in the second study and these were highly correlated with the actual length of absence, accounting for 54% of the variance in length of absence (compared with 24% of the variance without an examination). The obvious interpretation is that the examiner was asking the officer how long he or she expected to be off work, either according to self assessment, or that of the treating physician. It may also be that the examiner was paying attention to other aspects of the patient, for instance social and psychological factors such as those measured in the study and which are shown to be relevant to recovery time.

6.4 The rationale for using the date of the return to work as the outcome measure. The date of return to work is a somewhat 'grey' measure in that it may not coincide exactly with the total rehabilitation of functional capacity (the so-called status of being '100% fit'). The date of return to work is, however, not arbitrary and it coincides with a decision by the patient or by the patient's doctor that, for all practical purposes, 'recovery' has been achieved. Maeland et al. (1986; 1987) in their study of the social and psychological predictors of length of absence, and completeness of recovery after myocardial infarction, use the time of return to work as their outcome measure. They state:

'Judging from the literature, return to work has, by tradition, been considered the most important outcome measure after an acute myocardial infarction. Obviously employment status is of major interest in evaluating the socio-medical consequences of a serious illness. Among previously employed persons, resumption of work defines the transition from the sick role to an active social position. In socio-economical terms return to work implies the end of social insurance expenditure. (And perhaps most importantly) From a medical point of view, resumption of work indicates a relative freedom from disabling symptoms and dysfunctions. In addition return to work is advantageous as an outcome measure since it provides easily obtainable information about both level of functioning and duration of disability.'.

In other words this outcome measure has several practical advantages in that it provides easily obtainable information about both level of functioning and duration of temporary incapacity.

Although there may be criticisms of this as an outcome measure, what alternatives exist? It was not financially possible nor desirable from the point of view of the design of the study to carry out physical examinations throughout the convalescence since the aim of the study was to observe, as unobtrusively as possible, the normal process of convalescence. The implicit message in any heavy handed approach to convalescing patients is that their progress is being monitored, possibly with a view to speeding up the return to work.

Analogous to the above discussion of the assessment of injury severity, the timing of a follow up outcome measure based on a clinical examination is a problem. Possibly these could have been carried out on that date which had been originally predicted by the examiner. This would again have involved depending on the assistance of an independent clinical examiner, the procurement and maintenance of which person was one of the major stumbling blocks in the study. The disadvantages of using return to work as the outcome are more than outweighed by its simplicity and visibility and by its not interfering with the phenomenon being observed.

6.5 The calculation of the 'adjusted recovery rate' (ARR). It was concluded that the estimates of recovery time produced by the adjudicators in both longitudinal studies was sufficiently accurate to use as a base to calculate the adjusted recovery rate. Both Allodi and Montgomery (1979) and Brewin (1983) used the adjusted rate of recovery as a measure of injury severity. The recovery time is 'adjusted' to the degree that its calculation includes a reasonable time period for recovery, beyond which, or less than which, the recovery could be considered 'delayed' or 'accelerated'. The actual recorded period of absence is divided by the mean of the three estimates of probable recovery time, and this produces a fraction, as follows: if the mean of the medical adjudicators' estimates of recovery time for a particular injury was 12 weeks and the person was actually absent for 13 weeks, then the return to work is more or less when expected, as denoted by how close to '1' is the resulting ratio measure. In the above example, 13 / 12 = 1.08. If the estimated length of absence is 7 weeks and the person returns to work in four, then this is a shorter recovery time than expected, as denoted by the ratio measure less than '1', 4 / 7 = .57. (see Appendix P, for these calculations in the first prospective study). This mathematical adjustment allows the severity of the injury to be taken into consideration while assessing the influence of social and psychological factors.

6.6 Why is deciding on a reasonable recovery time a difficult task? The variation in the estimates of recovery time (Appendices P and FF) and the fact

that the adjudicators described the task as a difficult one perhaps requires some explanation. The adjusted recovery rate is based on the ability of doctors to estimate typical recovery time after injury. Any clinical judgement involves the implicit or explicit weighting of probabilities. The work of Kahneman et al. (1982) demonstrates that people are not good at dealing with probabilistic information in statistically normative ways, and, of course, doctors are no exception to this common phenomenon. The following quote is relevant in this context,

'Numerous studies have shown that people - including experts - have great difficulty judging probabilities, making predictions and otherwise attempting to cope with uncertainty. Frequently these difficulties can be traced to the use of judgemental heuristics which serve as general strategies for simplifying complex tasks.' (Slovac et al., 1985).

Doctors use these heuristics or cognitive short cuts, based as they are on bits of knowledge, rules of thumb, previous experience, personal bias and a number of other factors. It has been proposed that, in making clinical judgements, doctors use social and psychological data on the patient; this topic was discussed in Chapter 1. The examination of these clinical heuristics is outwith the domain of this thesis, although the discussion of the difficulty associated with estimating severity depends on knowing how doctors go about their business.

Skill at making such estimates also depends on the doctor's having obtained and stored information about previous cases; Eiser and van der Pligt (1988) propose that doctors do not receive adequate feedback on the outcomes and quality of their decisions. They quote Mandel, from his book *Proper Doctoring*(1984) who proposes that the problem of learning from experience is compounded in several ways, not least of which is the fact that "patients and their diseases are so varied that the outcome in an individual patient is uncertain". Moreover, the doctor is often his or her own monitor, and has to judge whether the improvement in the patient's condition was really as a result of his or her treatment, or to do with some ill defined placebo effect. In addition, rarely does any professional receive honest criticism or feedback from peers and colleagues, and patients may confuse *any*

attention with clinical excellence which would also constitute an inaccurate source of feedback. For all these reasons, Mandel proposes, the feedback which is so important for learning is usually not available, thus the normative data required for more accurate estimation of outcome is seldom acquired.

The customary approach of doctors in the more natural clinic setting also contributes to the difficulty they might have in estimating recovery time. The usual clinical modus operandi is to monitor cases rather than predict the outcome, and hence the task is an unusual one.

6.7 Consideration of the relevance of the physical requirements of the job to the length of absence after injury. A quite basic assumption in this type of research is that the physical demands of a job will have an influence on the length of absence. This is often considered to be a physical (as distinct from social or psychological) determinant of recovery time. Specifically, the more physically demanding one's job the longer will be the time required to be ready to return to work. There is no question that this is broadly the case: a person with an office job could return to work with a lower limb plaster cast, if they wished, while a shop assistant could not. In the second study the influence of the physical demands of the job were analysed. According to a fairly detailed breakdown of the officers' perception of their physical job requirements. This was obtained during the clinical examination. Although all were police officers, there are jobs like that of the bar officer, that are physically less demanding than that of a beat constable. Even within the beat constable's job there are variations dependent upon the opportunities that there were for car patrol, or the nature of the terrain. One can expect that broad differences in job requirements would have an effect on the speed of return to work, but more subtle differences would not.

To measure the job requirements, the most useful method was to ask the officer to estimate the percentage of the total working time spent on particular activities. The clinical interviewer reported that the subjects found this task quite difficult for the following reasons: (1) the three shift rotation may involve different

types of work because the shifts cover different times during the 24 hours; (2) there is an essential unpredictability to the work of a police officer since it is reactive to various events for example, a football match, a spate of theft in one area, security and patrol work for special occasions; (3) it is unpredictable because there may be many days of simply walking the beat, and then a sudden occurrence which requires an active response; (4) it seemed that thinking about their work in this proportional sort of way was quite an unfamiliar exercise, and is likely hard for anyone to do. It was, however, considered to be the best way of obtaining the information, and an indication of *their perception* of the level of physical activity that would be required upon resumption of duties.

In the clinical interview the following question was posed:

"In your normal work as a police officer, can you tell me what percentage of your working time, within about 10%, is spent on the following activities? You do not need to be completely accurate, but just approximately relative to each other activity in the list."

The subject was shown the list which included the following eight separate activities: standing, walking on pavement, walking on rough ground, climbing stairs, driving a car, driving a motorcycle, sitting doing paperwork, dealing with violent or drunk people. The officers were also asked to list any other activities done quite a lot (in the workplace, although many mentioned off duty activities), and if they had any other comments on the physical demands of the job. They were also asked which of the activities, if any, they thought would be 'difficult or impossible just now'. Aside from any utility for the prediction of recovery time, this exercise produced very interesting data to do with the officers subjective assessment of the physical requirements of their jobs.

The 52 subjects, apart from three in specialist jobs which could not be categorised in this simple way, were put into three groups as follows: 'beat' (n = 24), 'mobile' (n = 18) and 'office' (n = 7). The categories were based on that

activity at which the officer acknowledged spending the highest percentage of his working day: foot patrol duties, driving in mobile patrol and paperwork. In the same analysis officers were asked to estimate the percentage of their time spent handling drunks and violent offenders. Those on foot patrol on average estimated 4% while those on mobile patrol estimated 3%, being slightly more protected in the cars. The following table (6.7.1) represents the relationship between length of absence and the main type of activity at work.

Table 6.7.1

The relationship of LOA in days to the injury severity and the nature of the principal task at work

	less severe	more severe	total days
beat	53 (n = 12)	78 (n = 12)	65
mobile	55 (n = 11)	98 (n = 7)	69
office	43 (n = 3)	59 (n = 4)	52

By performing an analysis of the variance of length of absence, there was no significant relationship attributable to the category of duty ($F = .812, p = .45$), although the three broad groups bore a limited relationship to recovery time. The mean estimate of recovery time were just under nine weeks for both the beat and mobile patrol groups; the mean estimates of recovery time for the office workers was ten weeks, indicating that the medical adjudicators thought that the injuries in this group were more severe.

The main concern about returning to work was a real one to do with being physically equal to a sudden demanding situation. They also expressed worry about the possibility of letting their working partner down, again a real concern in a dangerous situation. Worry about further injury or experiencing pain can lead to

self protective behaviour, which is simply inappropriate on the beat. Unlike many other occupations being almost functionally fit is not good enough for beat duties. Overall the seven subjects in office jobs were more severely injured than those on patrol, but at the same level of severity, those in office work returned to duty, as one would expect, most quickly. This underscores the necessity for the employer to take a broader perspective and to ensure that there are graduated positions and part time work available. In this context it is worth mentioning that, within Strathclyde, 'light' duties can be organised for individual officers, but these are allocated on a haphazard basis. As will be discussed more fully in the Conclusions to the thesis, a policy of consistent provision of light duties and gradual part-time duties is being implemented where appropriate.

6.8 Conclusions. The difficulties that were encountered in developing a method to account for injury severity in this study were not anticipated. One of the difficulties was that the injuries in this series were all at the minor to moderate end of a scale of injury severity and, while methods exist which can discriminate between injuries that are grossly different, making such a distinction at this lower level is extremely difficult. Different methods to account for injury severity were considered, including attempting to develop a scale based on various anatomical measurements; a preliminary test of this idea was unsuccessful. Classification of an injury according to whether it was a sprain or a fracture, or whether it was to an upper or lower limb bore no relationship to length of absence. That there is an imperfect relationship between the 'severity' of an injury and initial anatomical damage is demonstrated in some of the studies reviewed in Chapter 2. The severity of an injury can imply many different aspects of the initial injury, and of the injury consequences.

The method of accounting for injury severity used in previous research was adopted (Allodi and Montgomery, 1979; Brewin et al., 1983). Again, after having settled on this apparently simple method, difficulties were encountered in obtaining reasonable estimates of recovery time from doctors. Many issues emerged from this exercise which could lay the way for future research into the development

of a method to account for injury severity which is based, not on initial anatomical measures but on a rule induction of what severity means conceptually to practitioners.

Chapter 7: The First Prospective Study

Abstract. This Chapter describes the first prospective study which investigates the degree to which social and psychological factors can predict length of recovery after accidental injury in police officers. The officers (n = 82) in the study were physically examined a mean of twelve days after injury. Several doctors estimated the likely recovery times for the various injuries. From these estimates a rate of recovery adjusted for the severity of the injury was calculated. A questionnaire was completed by the officers a mean of 14 days after the injury, from which eleven predictor variables were obtained. These factors were grouped according to affective measures, factors to do with work, and causal perceptions of the injury incident. The officers' illness and injury histories were also obtained from the Medical Department records (with the permission of the Chief Medical Officer) and these variables were compared with an outcome of adjusted recovery rate in regression analysis. The results confirmed a number of the specific hypotheses of the study, and the general hypothesis that social and psychological factors do have some influence on recovery rate. Different social and psychological processes are involved in recovery from on duty injuries as distinct from off duty injuries, although there was no significant difference in the mean length of absence after injuries of these two types. Around 30% of the variance in recovery time was accounted for by the variables selected, which begs the question as to what other factors might be important other than those tested. The implications of these findings for recognising vulnerability in police officers are discussed.

7.1 Introduction. This study examines factors which are associated with length of absence after injury, rather than considering affective state during convalescence, which was the subject of the cross sectional study. In this study the measure of adjusted recovery rate described in Chapter 6 is used as the outcome variable. The study was prospective in design, and the plan was to collect a sample of police officers who were injured in incidents on or off duty, and obtain clinical and psychosocial measures on these subjects early on in the convalescence.

7.2 The rationale for predictors applied. Social and psychological sources of variance in recovery time are of interest in this study. It was thought that by restricting the variance of the demographic characteristics, more subtle sources of variation would become obvious. Certain demographic characteristics of the sample were considered to establish their basic relationship with length of absence. e.g. gender, marital status, whether the injury occurred on or off duty.

There were proportionately very few females in the sample (n = 4). The mean length of absence for the females was less than for the 78 males (adjusted recovery rate 1.3 compared with 1.5 for males, a non-significant difference), and the females' scores on all affect measures were lower. There was no obvious relationship between gender and length of absence, but any relationship may have been masked by there being so few females. Gender was not included as a major predictor.

Brewin et al. (1983) had found that married subjects returned to work more quickly. There were 16 subjects in the present study who were not married nor living as married and they took a shorter time to return to work, although not significantly. As this difference was not significant, and because there were relatively few unmarried subjects, marital status was not included as a predictor.

A common expectation is that to be injured on duty would be conducive to a longer recovery period. This idea is based on notions about compensation payments and perhaps on assuming that an officer would feel that he or she deserved a break because the injury happened at work. These issues are dealt with throughout the thesis, but for the purposes of establishing useful predictors, the mean length of absence after on duty injuries was compared with the mean length of absence after off duty injuries using a *t* test. The mean length of absence for on duty injuries was 67 days and that for off duty injuries 71 days, but the difference was not significant ($t = -.58$, $p = .56$). In view of this, whether the injury happened on or off duty was not included as a predictor.

To consider the other variables, Allodi and Montgomery (1979) had access to fairly detailed medical histories of the participants in their study. It is unfortunate that the researchers did not include illness or injury history as a predictor of recovery rate, which would have allowed comparison with the present research. The researchers did establish, however, that the accident and control groups were significantly different in their past history of accidents, and other medical problems. In the present study, previous illness absence is included as a predictor. It could be that a high previous sickness absence would encourage a speedier return to work, for fear of reprimand at work for having a 'bad' sickness record. Alternatively, the amount of previous illness absence may be the consequence of the approach of the officer's General Practitioner in issuing sick lines. It might also be a reflection of the officers' approach to being off work, having had substantial absences in the past then there would be no harm in staying off a bit longer for the current spell. In the present study, although no direction was predicted, illness absence history was expected to have an influence on recovery time.

Job satisfaction has been found in previous research to be a determinant of rate of recovery (Brewin et al., 1983; Allodi and Montgomery, 1979), specifically that those more dissatisfied with their jobs would stay off work longer.

No previous research has established a relationship between length of absence and affective state during early convalescence. Some studies have, however, demonstrated a *correlation* between depression and chronic incapacity, especially in low back pain (Romano & Turner, 1985). These reviewers conclude that because of the lack of proper prospective analyses of this association, the usual order of events cannot be clarified. It is not clear from these studies whether the onset of depression predates the development of chronic incapacity, or whether the reverse is more often the case. The previous cross sectional study in this thesis also obtained a correlation between the length of incapacity and psychological symptoms.

The function of depression and anxiety in recovery from moderate, common injuries is not known. A person who is depressed may not utilise available resources, such as regular attendance at physiotherapy treatment, to speed his or her recovery. Anxiety may also influence recovery time since a person who is tense and anxious may not relax sufficiently to recover from the physical and, in some cases, psychological trauma of personal injury. Sleep may be disturbed because of anxiety which is not conducive to a positive recovery. Anxiety was measured as an outcome in the study by Brewin et al. (1983), rather than as a predictor. They found that those subjects who returned to work more quickly also reported feeling less anxious (measured two to four weeks after return to work) than those who took longer. From their study it is not known what was the affective state during convalescence, before they returned to work, and whether this could be a predictor of length of absence.

The association between anxiety and recovery is not well researched, although there is a large literature on 'injury neurosis' (starting from Miller, 1961). In the present study, anxiety and depression are measured using the Hospital Anxiety and Depression scale, and by the General Health Questionnaire. Although there is no literature to guide an hypothesis, it is expected that elevated levels of both anxiety or depression at the beginning of a convalescence will result in a longer than expected recovery time.

The experience of recent significant life events has been demonstrated to be one of the factors which contribute to the onset of depression (Brown and Harris, 1978). Other research points out the association between significant life events and stress related illness (Totman, 1979). The precise nature and direction of the relationship between experiencing a life event and the time taken to recover from an injury is not known, and cannot be informed by existing literature.

Brewin et al. (1983) had found that the attributions the person made about the injury circumstances were influential in determining length of absence, specifically, the patient who felt his accident to be due to his own carelessness or

negligence returned to work more quickly. In attributional terms, making an internal rather than an external causal attribution was associated with faster recovery and appeared to depend upon whether the person perceived that they deserved blame, rather than on more objective causal issues.

Social support may also influence recovery rate. Waddell (1986) had proposed that family support for 'illness behaviour' in low back pain patients may be conducive to slower recovery, or indeed to failure to recover. On the other hand, MacKenzie et al, (1988) had found the existence of a confidant to be associated with a faster recovery time. The precise function of social support in moderating the stressful effects of life events, and chronic stressors has been discussed by Cohen and Willis (1985). The area is confused by the different ways in which social support might be measured. A lack of social support at home might be conducive to a faster return to work in order to avoid unpleasant domestic scenes. It might, on the other hand, be conducive to staying away from work longer in an attempt to get more attention, sympathy and care from people at home. The direction of any relationship is not clear, but (as discussed in Chapter 4) the particular measure of social support at home that was applied in this first study yielded little in the way of variability in scores. Most people acknowledged receiving positive practical help and emotional support from their partner. The influence of social support at home was not included in the regression analysis.

Police work involves a high degree of social interaction with fellow officers. Officers most usually work in pairs because Scottish law normally requires the evidence of two witnesses, in order to prefer a charge against a suspect. Working with others also affords some protection in dangerous situations. In addition, being a hierarchical organisation there is a large amount of daily interaction with supervisors (sergeants and inspectors) and so relations among all these people are important. Convalescents may wonder what the people at work might be thinking about their being off. A variable measuring social support at work was included in the regression analysis.

7.3 The hypotheses. The main hypothesis is that the time taken to return to work after injury will be the consequence, not only of the severity of the injury, but also of certain psycho-social characteristics. All of the following hypotheses assume that injury severity is taken into consideration. Specifically, the hypotheses of this study are:

Hypothesis 1.
Those who acknowledge more depressed affect during early convalescence will return to work more slowly than those who do not.

Hypothesis 2.
Those who acknowledge more anxiety during early convalescence will return to work more slowly than those who do not.

Hypothesis 3.
The experience of a significant, threatening life event in the previous 12 months will influence the length of recovery from injury.

Hypothesis 4.
Those who are dissatisfied with their job will return to work more slowly than those who are satisfied.

Hypothesis 5.
Perceived social support at work will influence the time taken to return to work.

Hypothesis 6.
The attributions which the person makes about the accident will influence recovery rate: attributing the cause or blame for the accident to external factors will be associated with a slower recovery rate, than those attributing the cause or blame to internal factors (oneself).

Hypothesis 7.
Previous illness and injury absence history will influence recovery rate.

7.4 Method. Subjects for the study were obtained in the following way. The Medical Department receives a written form which notifies of an officer's absence

through illness or injury from the fifteen territorial Divisions or other departments within Strathclyde Police. For the purposes of the research, the nursing sister in the Chief Medical Officer's Department was asked to search these notifications for limb injuries which might be suitable for the study. She would then telephone the officer, explain the research, invite him or her to participate, and if they agreed ask further questions about the injury. The initial contact had to be made by the nursing sister from the Department because of ethical considerations to do with access to the officers' home telephone numbers, and because clinical judgement was required. A decision was made by the nursing sister at that time, based on a very rough guess about the possible length of absence, whether the officer would be a suitable candidate for inclusion, according to clinical criteria to do with likely length of absence. Arrangements were then made to examine the officer at his or her home, or at Headquarters.

The information provided in the forms sent to the Medical Department is stated in the most vague terms and gives very little guidance as to what is actually wrong with the officer. They give no indication as to the severity of the injury or potential eventual length of absence. Most often the injury would be loosely described as 'injured' or 'painful' leg or hand, which was not informative. Because of this lack of initial information, the process of collecting subjects yielded many false positives, and was extremely time consuming. Many telephone calls were made to officers who had already returned to work or who were planning to return to work within the next few days. The telephone calls often turned into quite lengthy interchanges of up to twenty minutes. The nursing sister, quite correctly, did not think that it was appropriate simply to stop the conversation if the officer to whom she was speaking was not suitable for study. Other issues emerged during these telephone calls which were not relevant to the study but which were relevant for the care and treatment of the officers and to the business of the Medical Department. A very good response rate was achieved in that only two people whom the nursing sister contacted did not want to take part.

7.5 Subjects. Selection of the subjects was made by the nursing sister because the initial decision to include was based on clinical information. The 82 police officers in the final cohort had sustained injury to an upper or a lower limb, shoulder or knee, which required absence from duty for at least 14 days. The shortest period that any subject was absent was 2 weeks and the longest was 26 weeks. Of the sample, 5% were female (n = 4), which is under-representative of females in the Force generally who comprise almost 8% of all officers. The mean age of the sample was 33.3 years, range between 21 and 53 years. Seventy five of the sample (just over 90%) were beat constables, and five were sergeants, the remaining two were a detective constable and a detective sergeant. Sixty six (80%) were married (or acknowledged living as married) and the remaining sixteen were single, divorced or separated. They were drawn from several different divisions within the area policed by Strathclyde Force.

7.6 How and where the injuries happened. The sample so happened to be approximately equally divided between on and off duty injuries: there are 43 on duty injuries and 39 off duty injuries. Considering the overall incidence of on duty injuries in the Force, they are over represented in this series. This is not a difficulty for research design, however, since the thesis does not concern incidence. A discussion of the causes of these injuries and the circumstances under which they occur was included in Chapter 3, and the specific incidents are listed in Appendix C. The incidents are summarised in Table 7.6.1, on the basis of the following classification. Any injury which resulted from an attack or struggle by another person, with or without a weapon, or by a dog purposefully sent to attack the officer was classified as an assault. On duty injury can occur when chasing a suspect and quite often officers trip or fall in that circumstance, this was considered to be a different category than a simple slip, trip or fall while walking or carrying out routine activities on duty.

Considering off duty incidents, the 'home' category would include any injuries which are the consequence of do-it-yourself activities, or of doing other

maintenance work around home. The sports injuries are separated into 'sports with others' or 'sports alone' to distinguish between injuries which are the result of a collision or tackle with another player, and sports injuries which are the result of solitary sports activities, such as jogging, or sports training. In this latter category of solitary sports injuries are also included those strains, sprains and fractures which are the result of 'going over' on an ankle or tripping and falling in the course of a team sport, but in which no other person was involved in the incident.

Table 7.6.1
Circumstances of the injuries.

On Duty (n = 43)	N	%
assault	26	60
slip/trip*	8	19
chase	7	17
road traffic accident	1	2
sports with others**	1	2

* This category includes the two circumstances of subject 99 (crush by horse box), and subject 63 (shut his own hand in door of police vehicle) which cannot be categorised elsewhere.

** While training at the Scottish Police College.

Off Duty (n = 39)	N	%
sports alone	13	33
slip/trip	11	28
sports with others	7	18
home	5	13
road traffic accident	3	8

An item included in the questionnaire (Appendix D) asked whether the officer expected to be injured and if so, where. Nearly 10% of the sample expected to be injured in sports activities, and comments would be made to the effect that, 'you learn to expect this in contact sports' or 'its a hazard of the game'. Although as many as one third of the total sample expected to be injured at work, the same acceptance of such injuries as 'just one of those things' was not found. To have actually been injured at work significantly raised the expectation of injury at work, 40% in the on duty injury sample, in contrast to 25% of the off duty injury sample expected to be injured at work. Just over thirty percent of the sample had no further expectation of being injured under any circumstances.

7.7 The types of injuries in the sample. The types of injuries sustained by this sample were common orthopaedic injuries and are very similar to those sustained in that sample of industrial injuries studied by Brewin et al. (1983). All were minor to moderate, such as strains and fractures, or superficial tissue damage, such as lacerations, abrasions and contusions. Appendix P presents a detailed list of the injuries and the length of time in weeks that the officers were absent from work as a result of these injuries; these are summarised in Tables 7.7.2 and 7.7.3 below. For the purposes of broad categorisation, sprains and strains are combined, although clinically a sprain implies that the ligaments have been torn, while a strain implies that the ligaments have been stretched.

There are 46 upper and 36 lower limb injuries. In the off duty sample there were more lower limb injuries (59% of the off duty injury sample compared with 30% of the on duty injury sample). This proportion reflects the preponderance of sports injuries: ankle sprain, fractured phalange, metatarsal, and metacarpal, as well as twisting injury to the knee which are the consequence of a tackle, or running and stumbling, or colliding with another player in a football or rugby game. There were more upper limb injuries in the on duty sample (70% of the on duty injury sample compared with 41% of the off duty sample), which reflects the amount of manhandling required in the job. Arms and hands would be used in self protective gestures against direct blows and to break a fall when pushed over in a struggle.

Table 7.7.2
Injuries On Duty

Site	Fracture	Sprain	Lacer	Abras	Contus	Total
Foot	0	0	0	0	0	**0**
Ankle	3	3	0	0	0	**6**
Knee	0	3	0	0	1	**4**
Leg	0	0	1	1	0	**3**
Total Lower	**3**	**6**	**1**	**2**	**2**	**13**
Hand	10	2	2	0	0	**14**
Wrist	6	3	0	0	0	**9**
Arm	1	0	0	0	0	**1**
Elbow	1	0	0	0	0	**1**
Shoulder	0	5	0	0	0	**5**
Total Upper	**18**	**10**	**2**	**0**	**0**	**30**
Totals	**21**	**16**	**3**	**1**	**2**	**43**

Lacer = laceration
Abras = abrasion
Contus = contusion

Table 7.7.3
Injuries Off Duty

Site	Fracture	Sprain	Lacer	Abras	Contus	Total
Foot	6	0	0	0	0	**6**
Ankle	0	11	0	0	0	**11**
Knee	0	5	0	0	1	**6**
Leg	0	0	0	0	0	**0**
Total Lower	**6**	**16**	**0**	**0**	**1**	**23**
Hand	4	0	2	0	0	**6**
Wrist	4	0	0	0	0	**4**
Arm	3	1	1	0	0	**5**
Elbow	0	1	0	0	0	**1**
Shoulder	0	0	0	0	0	**0**
Total Upper	**11**	**2**	**3**	**0**	**0**	**16**
Totals	**17**	**18**	**3**	**0**	**1**	**39**

A preliminary analysis was carried out to find whether significantly different periods of recovery are associated with different lesions, or associated with injuries occurring to different anatomical sites. It is possible that having a broken tibia requiring a plaster cast might restrict mobility and cause more difficulties in the long run than a broken radius. Also one might think of a fracture as being a more severe injury, or being clinically more problematic than a sprain. Some of the fractures in the series were of extremely small and functionally unimportant bones in the foot or hand. For this reason, and because sprains can be very debilitating, there was not such a large difference as one might expect between the recovery time following a fracture compared with that following a sprain or strain: the mean length of absence for a fracture was 76 days and 67 days for strains and sprains. Whenever data are placed in categories, there is a commensurate loss of detail, thus rendering the differences between the categories so formed less distinct. Categorising an injury solely according to whether it is a fracture or a sprain does not provide a large amount of explanatory power for the length of absence. The situation becomes even more complicated when considering soft tissue injuries, such as lacerations which may or may not involve nerve damage. These facts, which are discussed in Chapter Six, obviated the possibility of generating an injury severity rating based on the type and site of injury.

7.8 Measures. The initial aim in the study was to obtain all measures ten days following injury, in order to allow any potential clinical complications to settle (this point is discussed in Chapter 6). In practice the clinical examination was carried out a mean of twelve days after the injury, using a clinical pro-forma (Appendix I) and the psychological and social measures were obtained by Questionnaire (Appendix D) a mean of 14 days post injury. Table 7.8.1 lists the variables which were measured in the Questionnaire.

Table 7.8.1 Eleven predictor variables

Variable name	What it measures
Previous illness absence	Sum of previous illness absence (both short and longer term absence), divided by the length of service
Previous injury absence	Sum of previous absence due to injury, either on or off duty, divided by the length of service
Anxiety	Hospital Anxiety Scale
Depression	Hospital Depression Scale
GHQ12	General Health Questionnaire
Life events	Threat of life events in year prior (Brown and Harris)
Work social support	Perceived emotional support and practical help from colleagues and supervisor at work
Work satisfaction	Sum of ratings of various aspects of the job
Age / Service	Age / Length of service
Culpability	Attribution of culpability for the accident
Causal responsibility	Attribution of causal responsibility for the accident

7.9 Correlation matrix of all predictor variables. A correlation matrix of all the social and psychological variables, with the length of absence and adjusted recovery rate is presented in the Appendix M to provide insight into the underlying relationships between the variables of interest. Calculating the correlations among the data in this way also allows a check for the levels of intercorrelation between the independent variables, and allows one to look for multicollinearity, none of which was found.

As expected the affective measures correlated appropriately with each other, and the measure of threatening life events positively correlated with the scores on the Hospital Anxiety and Depression Scale, and the General Health Questionnaire. The measures are, therefore, related but not so highly correlated that they cannot be entered into a regression analysis independently. The severity of the injury as deduced from the mean estimates of recovery time, correlated positively with the score of depression. The more severe injuries in the series which included fractures of the scaphoid bones of the wrist, a fracture to the os calcis and deep lacerations of the hand would not only have been painful but be very physically restrictive. A further and more thorough test of this possible relationship is required in future research.

7.10 Correlation of predictor variables with the outcome of length of absence and adjusted recovery rate. The mean of the estimates provided by the doctors correlated significantly with length of absence ($r = .51$, $p = .0001$) indicating an acceptable basis for the calculation of the adjusted recovery rate. Only previous illness absence ($r = .24$, $p = .03$) and the experience of previous threatening life events ($r = .24$, $p = .03$) significantly correlated with length of absence, before the influence of injury severity is taken into consideration. Other correlations are presented in the correlation matrix (Appendix M). Once injury severity is considered by applying these variables to a dependent variable of adjusted recovery rate, only one significant simple correlation was found. Illness history was ($r = .326$, $p = .0028$, simple

regression $R^2 = .107$). It is possible that the predictor variables would show a relationship with adjusted recovery rate, in combination with each other. To find this out a multivariate statistical technique must be used.

7.11 Multivariate analysis of eleven predictor variables on recovery rate by multiple regression. All eleven variables (listed in Table 7.8.1) were presented to the regression analysis (Appendix R). This yielded a regression equation which accounted for only 14% of the variance : $R^2 = .258$, *adjusted* $R^2 = .141$; ($F_{11,70} = 2.2$; $p = .023$). Illness history, injury history, depression and anxiety appeared to make some contribution, but quite clearly this particular group of variables did not help to explain a great deal of the variance in recovery time. In order to clarify the relationships, the stepwise procedure was applied which, as described in Appendix S, selects variables according to an a priori level of significance. This procedure selected only one variable, illness history, which accounted for ten per cent of the variance in recovery rate ($R^2 = .107$) which suggests that there must be many other influential variables which have not been taken into consideration. Considering that the predictor variables could reasonably be expected to influence recovery time, which was the basis of their selection, it is somewhat surprising that only one was selected as significant. Why, for instance, did the measure of culpability not contribute to the explanatory power of the equation, particularly in view of the importance of this factor in determining recovery rate in the hospital sample studied by Brewin et al. (1983)?

7.12 Is there another way of looking at these data? Could it be that the variables interact with each other and the outcome depending on the subjects' membership of a sub group within this larger data set? Compared to a hospital population, for example, the sample is quite homogeneous and had been selected in order to reduce some sources of demographic variation. There are, however, still differences among the subjects. Comparing this study to previous work, the most obvious difference is that half the injuries had been sustained at work (n = 43) and half occurred off duty (n = 39): the subjects in the study by Allodi and Montgomery (1979) and that by Brewin et al. (1983) had all been injured at work.

The analyses were repeated with the sample separated into these two groups.

As a preliminary, the two sub groups so formed were compared to ensure that they were sufficiently similar on other variables for useful comparison of the main difference that of where the injury happened. The mean length of absence for on duty injuries was 66 days (*standard deviation* 36), while that for off duty injuries was 72 days (*sd* 37); this difference was not significant ($t = .48$; $p =$ ns). The mean estimates of recovery time for the two groups was not significantly different ($t = .39$; $p = .7$), implying that on average the individuals in the two groups were injured to approximately the same degree of severity. The officers injured on duty were younger (mean age 32 years) than those injured off duty (mean age 34 years), although not to statistical significance. The only significant difference between the groups concerned the attribution of culpability and causal responsibility for the accident: officers injured on duty attributed the blame for the incident to other people or external factors more than did those injured off duty ($t = 7.0$; $p = .0001$). Similarly, the cause of on duty incidents was seen as being external ($t = 5.5$; $p = .0001$). This difference in attributions depending on where the accident happened makes intuitive sense: one would expect an assault at work to be seen as someone else's fault. So, rather than being an incidental, additional or irrelevant difference, this difference in attributions was directly related to the basis upon which the groups were being compared. On other variables, the two groups were considered to have sufficiently similar average values for valid comparison.

7.13 Regression analysis treating the on and off injury groups separately. A multiple regression analysis was performed on the data from the officers injured on duty (Appendix T). This produced a far improved equation which accounted for 35% of the variance ($R^2 = .526$, *adjusted* $R^2 = .358$, $F_{11,31} = 3.13$, $p = .006$). The *adjusted* R^2 provides a more conservative interpretation of the explained variance since it is adjusted for the number of variables included in the equation. To clarify the relationships, the stepwise technique was applied to this data set (Appendix U). This confirmed the relevance

of four variables in order of importance: culpability, depression, the experience of a threatening life event in the year prior to the injury and a perception of being socially supported at work (*adjusted* R^2 = .269). When this equation is compared with the previous *adjusted* R^2 (.358)which was achieved by multiple regression without the stepwise technique having been applied, there is a reduction in explanatory power. In multiple regression the more variables applied, usually the greater the amount of variance in the outcome variable which can be explained. There is a compromise, however, in that the more variables which are included the less parsimonious it is and the less easy it is to interpret. Nevertheless, applying all the variables to the analysis did produce an improved R^2. Those which had made this improvement were, however, not included by the stepwise technique.

No previous research has been conducted which looks at the time taken to return to work after a non-work injury, so there is little guidance as to the selection of relevant variables. The eleven predictor variables were again presented in regression analysis to the data from the sample of officers injured off duty (Appendix V). The equation produced from including all eleven variables accounted for a quarter of the variance in recovery rate (R^2 = .47, *adjusted* R^2 = .253, $F_{11,27}$ = 2.17, p = .05). It was obvious from looking at the resultant F *values* that only two variables were associated with length of recovery: the officer's history of illness absence and feelings of anxiety. In view of this a stepwise analysis was performed which confirmed the importance of previous illness absence in determining the current length of absence after an off duty injury, this factor alone accounting for 30% of the variance in recovery rate (R^2 = .297, $F_{1,37}$ = 15.7, p = .005). Applying this technique clarifies the relationship between the predictor variables and the outcome and in this case improved the explanatory power of the equation. In this case the unadjusted R^2 can be reported since there is only one variable accepted into the equation. Anxiety was the next most important variable, but its F value did not reach the criterion for inclusion. This equation was more parsimonious than that produced for the on duty sample, in that just one variable had greater explanatory power. Among officers injured off duty, it would appear that a longer recovery period is associated with having a

higher level of previous illness absence. It may also be associated with feeling more anxious although this relationship is not strong.

In discussing these equations it is important to remember that their influence on the outcome variable is in consonance with the other variables in the equation. Consultation of the correlation matrices (Appendices M, X and Y) shows that some of the variables found relevant in combination with others did not show a simple and independent correlation with the outcome of adjusted recovery rate. Some others, on the other hand, became less significant in combination with other variables (for example, length of service in the on duty sample).

Before discussing this equation further in terms of its explanatory power it is worth considering the factors which, surprisingly, were not important. Job satisfaction is proposed in the literature as being an important predictor of recovery rate (Brewin et al. 1983; Allodi and Montgomery, 1979) but in this sample the variable made no contribution to explaining recovery time. The measure of work satisfaction was that designed by Brewin et al. (1983) in their study of the industrially injured who were males working in many different manual jobs. It was adopted in the present research because of its simplicity. In retrospect it may not have been sensitive enough for use with the present population and it would appear that it failed to detect those nuances of work satisfaction which may be relevant to how long an individual will take to return to work after an injury. From a statistical perspective the variance in this measure may have simply been too small to allow prediction of recovery rate.

Scores on the General Health Questionnaire (GHQ) also did not contribute to the explanatory power of the equation. The failure of scores on the GHQ to predict length of absence may suggest that although the GHQ may be a good instrument for measuring change over time, it may not be the best for measuring a relatively stable affective state for predictive purposes. This was the observation made in the cross sectional study, in which the GHQ was sensitive to the temporary

changes in affect occasioned by convalescence. These points are discussed in Chapter 4.

7.14 Substantive findings. The relationships found in the overall analysis would appear, from these subsequent analyses to be two models combined, each being relevant to recovery from injury sustained under two different circumstances. There are different processes influential in the two groups (on and off duty), although being injured off duty or on duty is not associated with different average periods of time off work. Separating the sample into on on and off duty injuries substantially improved the explanatory power of each equation. The findings are summarised in Table 7.14.1, the results of the stepwise regression analyses are shown, followed by the results of the multiple regression analyses including all the relevant variables where this produces an improved result. The direction of the relationship with recovery rate is also shown. The influence of each variable is discussed in the Sections following the Table.

Table 7.14.1
Summary of the analyses.

I. The whole sample (n = 82). Ten per cent of the variance in recovery time ($R^2 = .107$) is accounted for one variable.

Variable	Direction of relationship
Illness history	positive

Including all the variables in the regression analysis produced an equation with less explanatory power (*adjusted* $R^2 = .142$) including anxiety (+), life events (+), depression (-) and injury history (-).

II. The sample of officers injured on duty (n = 43). A quarter of the variance in recovery rate (*adjusted* $R^2 = .269$) is accounted for by four variables.

Variable	Direction of relationship
Culpability	negative
Depression	negative
Social support at work	positive
Life events in previous 12 months	positive

Illness history (+) and length of service (-) were also shown to be related to recovery rate in the multiple regression analysis including all the relevant variables. The equation produced explained 35% of the variance in recovery rate (*adjusted* $R^2 = .358$).

III. The sample of officers injured off duty (n = 39). Thirty per cent of the variance in recovery rate ($R^2 = .297$) after off duty injury was explained by one variable.

Variable	Direction of relationship
Illness history	positive

Anxiety (+) was also shown to be related to recovery rate in the multiple regression analysis when all variables were included; the equation produced explained a quarter of the variance in recovery rate (*adjusted* $R^2 = .253$).

7.15 The influence of previous illness absence on rate of recovery. Previous illness absence accounts for a significant amount of the variance in rate of recovery after off duty injuries. It may, however, be thought of as reflective of more than only the individual's physical status. Absence history is taken in many studies (for example, Wolfenden, undated) as indicative of previous psychological as well as physical well being. Within the present sample, some of the absences which comprised part of the previous illness history were psychological in nature; for instance, three of the subjects were previously absent from work for lengthy periods of time (over two months in each case) for 'acute anxiety and depression' or 'nervous debility'. Other lengthy absences which are recorded as being for physical reasons may also have 'really' been for reasons of psychological ill health. In view of this detail it is quite justifiable to consider that the total figure for illness absence may be partly reflective of psychological status.

The positive relationship of previous illness absence with current absence can be interpreted in a number of different ways. The present longer absence could be just a typical piece of behaviour; that is the person just typically takes a long time off when the opportunity presents. Another equally plausible explanation is that the officer may have a particularly indecisive general practitioner who continues to provide sick lines. Having been off work frequently and for relatively longer periods in the past may also imply that the officer is simply more unhealthy than others, and this might render their recovery slower than in more healthy officers. Such people may believe themselves to be, or actually are physically more vulnerable, that is they are simply more 'sick' than others, and when injured will want to make sure they are completely better before returning to work. Yet another interpretation is that the officer has got over the embarrassment and potential social stigma of being off sick having been off frequently before and does not feel any social pressure to return.

7.16 The influence of affective state on rate of recovery. Measures of anxiety and depression obtained by the Hospital Anxiety and Depression Scale contributed to explaining length of absence. The negative relationship of depression

with adjusted recovery rate in the on duty injury sample is counterintuitive, but can be interpreted. In considering the different coping strategies which may be used by these officers, one might well be a proactive preventative health strategy. He or she may be aware that inactivity makes them feel more depressed and, as can be surmised from the results of the cross-sectional study (Chapter 5), this may urge a sense of wanting to get back to the action and to the structure of work.

Whereas depression would encourage a return to work, anxiety would make officers stay away longer. Police officers often feel conflict between the demands of home and the demands of work, such as fitting home life around the shift system. The ability to reduce the psychological pressure from one source may be conducive to wanting to stay away from work.

7.17 The influence of the experience of threatening life events on the rate of recovery. The fact of having experienced a life event of significant long term threat was also positively associated with length of absence, but only significantly so in the on duty injury sample. Considering the whole sample together, ten people had experienced significant life events to do with home, for example, a marital separation, or serious illness in a child and nine had experienced significant events to do with work, for example, a disciplinary inquiry, a poor assessment, or a police motor vehicle accident. Although the mean length of absence for subjects who had experienced events to do with work was higher (94 days), as distinct from those who had experienced events to do with home (75 days), the difference was not significant ($t = 1.33$; $p = .2$). It may suggest some avoidance of the source of the problem. There was no difference in perceived levels of social support at work, or in job satisfaction whether the officer had experienced a life event at work or at home. This implies that there are two, or at least two, different and unrelated reasons for staying away from work. One of these is to do with feeling comfortable with the workplace and feeling a sense of positive support; and the other quite the opposite, for the other group of individuals it is to do with having experienced a significant and threatening event at work.

What was the relationship between experiencing a significant life event and the affect measures? The cut off score for case level anxiety or depression on the Hospital Anxiety and Depression Scale is nine (Zigmond and Snaith, 1983). In the whole sample (n = 82) there were eight cases of anxiety, and three cases of depression; half of the cases of anxiety had experienced a significant event, three of them at work, and one of them at home. It is notable that of the three cases of depression in the sample, two had experienced a work event. None of these relationships was significant using a X^2 test. There does, however, seem to be an association between experiencing a significant event at work, and the likelihood of case level depression and anxiety. It is obvious that disciplinary action must be taken if an officer has committed an offense, but the implications of such disciplinary actions for the officer's psychological status must be taken into consideration.

In the context of the sequelae of experiencing a threatening life event, an interesting relationship was found as regards the greater likelihood of being assaulted in that group who had experienced significant events at *home*. Although this finding is not directly related to explaining recovery time after injury it may help to understand the incidence of injury and the circumstances under which an injury occurs. Half of those who had experienced a life event at home were injured in an assault, while *none* of those who had experienced a work event had been assaulted. This difference was significant ($X^2 = 6.12, p = .014$). Perhaps those who have already got into some trouble at work will be laying low and avoiding as many altercations as possible. In contrast, those who are pre-occupied with problems at home may not find the most conciliatory way of dealing with suspects in the line of duty, which could result in assault. Approaching their jobs with greater gusto than normal would perhaps be a way of diverting their attention and taking their minds off their problems. The relationship between life events and the likelihood of injury should be examined more carefully in future research.

7.18 The influence of perceived social support at work. A rather counterintuitive positive association was found between perceived social support at work and length of absence. Specifically, the more an officer feels emotionally supported and helped in a practical way by colleagues and supervisor at work, the longer he or she takes to return to work. Conversely, the less the officer feels supported and comfortable in the workplace, the sooner he or she will return to work. This potential influence of social support in terms of supporting illness was suggested by Waddell et al. in a series of pilot studies carried out on back pain patients (1984; 1987; and *personal communication*). They propose that social support at work might be of 'minor' benefit to, that is hasten, the return to work. The finding in the present study suggests that the opposite is true, at least in this sample using this measure. Social support at work measured at the beginning of the convalescence is associated with a longer absence from work.

This is only counterintuitive if one ascribes to the view that 'avoidance' is a more common coping strategy than direct problem solving, and if one fails to consider the particular characteristics of the police occupational context. Possibly the more uncomfortable an officer feels about his or her position at work the more he or she will feel driven to return to work. In this particular work context, avoiding conflict or ill feeling in the workplace may be a less likely coping strategy than getting back to work and 'staking one's place'. The officers' typical coping strategies were not measured in this study but it would be interesting to find whether coping style is associated with the length of recovery as suggested above. There are great pressures on police officers to maintain a low sickness record: fear of damaging this record, particularly if the officer senses that the work context is not completely supportive, might well encourage a quicker return. If an officer feels supported by the personnel at the workplace this may also allow him to feel relaxed and to recover properly. Among other aspects of the job, in the job satisfaction measure, subjects were asked to rate their satisfaction with their supervisor. Considering the specific responses to this item, the mean length of absence for those who were 'dissatisfied' with their supervisor (n = 11), was 48

(*sd* 18) days; while those who were 'very satisfied' with their supervisor (n = 12) stayed off work for a longer period of time, 59 days (*sd* 35). This simple comparison lends credence to the interpretation that feeling comfortable with the human relations in the office, specifically one's supervisor, can influence length of absence.

It was surprising that this measure was such a strong predictor of length of absence, although it is interpretable. It makes intuitive sense that those officers who, for whatever reason, feel nervous about their place at work may, indeed, return to work sooner than those who do not. This brings into question the issue that people may be returning to work too soon, and for the 'wrong' reasons, before they are fully recovered; much like those subjects in Brewin's study (Brewin et al.,1983) who may have been worried about the financial implications of their absence. These results did not become apparent until after the second prospective study was started. Although the finding did obtain some confirmation in the second study (by considering certain of the factors which contributed to job satisfaction) it is obviously a factor which requires clarification. The inter-relationships with and causes of social support at work and how this interacts with absence needs further study.

7.19 The influence of causal attributions about the accident on the rate of recovery. One very significant consequence of analysing these data according to whether the injury happened on or off duty was the replication and extension of the finding of Brewin et al. (1983). Feelings that one is to blame for the incident were associated with a faster return to work, but only in officers injured on duty. The present finding extends that found by the previous researchers. While they had established the same direction of relationship, the effect was only found between culpability measured *after* the person had returned to work, and as such would constitute a retrospective appraisal of the injury circumstances. In that case feelings of culpability would not function as a *predictor* of recovery rate. The present study was able to establish this causal direction.

Feeling blameworthy or culpable for an incident would be less relevant to the circumstances of accidents sustained off duty (apart from road traffic accidents), which generally do not have legal implications. Most injuries off duty were sports injuries (60%), and some others (n = 4) were injured while drunk (some in the 'slip/trip' category). The explanations which officers provided for many off duty incidents was it was 'just one of things'. This sort of attitude would be particularly the case in less serious injuries. No-one, on the other hand, who was injured on duty offered this statement. Bulman and Wortman (1977) found that people did make causal attributions about serious injuries which resulted in paraplegia or hemiplegia sustained in volitional activities. From this perspective, the on duty injuries can be construed as more homogeneous than off duty injuries.

7.20 Variables which were not related to recovery rate. Some variables which might reasonably be expected to influence recovery rate did not in this sample. Most particularly, satisfaction with various aspects of work did not influence the rate of recovery. Some reasons for this were discussed in Section 7.13 above. Job dissatisfaction is a cornerstone of the idea of secondary gain or malingering, and were this factor a strong influence there should have been at least some relationship with recovery rate. The finding in the present study questions whether feeling a bit disgruntled with certain aspects of the job is sufficient, in a group of dedicated and professional public service workers, to influence recovery time. The notions about the influence of job satisfaction seem somewhat simplistic, in considering the effect of such a factor on a complex phenomenon like absence after injury. Moreover such notions may be simply irrelevant in a sample of people who are in employment which they regard as a career rather than a job. Although plenty of police officers complain about their work, overall there is a high degree of satisfaction with the work. In view of the possibility that the simple instrument applied was insufficiently sensitive a more sophisticated instrument to measure job satisfaction was applied in the second prospective study.

An expectation would be that age would influence length of recovery. In this sample, there was no significant influence from age or length of service (these two variables are clearly strongly correlated .888), while this factor might be expected to have a considerable effect in a general hospital population, and in the opposite direction. Its unimportance in this study is probably attributable to the restricted age range in the sample. Length of service actually demonstrated a weak negative relationship with recovery rate after on duty injuries: those with longer service returned to work sooner than those with shorter service. The effects of older age may also be 'flattened' by the different job functions and approaches to the job by older officers. For instance, older officers would be more likely to be in a promoted post or an administrative post, in which the job function is basically supervisory or clerical, with fewer of the physical demands inherent in apprehending suspects. The mean age of the five sergeants in this series (41 years) was significantly greater than that of the 75 constables (33 years). Even although not promoted, senior constables are more likely to be placed in less physically demanding positions such as bar officer, in the courts branch or as a community constable. Furthermore, the older beat constables tend to approach their job with the benefit of accumulated work experience. They may use their craft rather than brawn in dealing with situations, preferring to negotiate a solution rather than physically assert one. Those officers injured in a chase were younger (32 years) than those injured in slips or trips at work (35 years), and perhaps more importantly they had four years less service. For all these reasons, there was no influence from age in this sample.

It was an expectation that previous absence due to injury would have an influence although the direction was not predicted. A tendency was found that those who had previously taken off time due to injury (whether on or off duty) were off work for a shorter time with the current injury. The variance in this variable, which is the consequence of the relative infrequency of injuries compared with the frequency of periods of illness, may explain the low predictive power.

7.21 Conclusion. In using a linear model in analysing data there is a loss of information as the regression equation attempts to resolve very complex interactions to a straight line. The particular measures adopted in this study are, in a sense, approximations of the factors which may be influencing recovery time. Taken together in an equation they help the understanding of recovery time and substantiate the view that recovery is not simply related to clinical factors but also complex social and psychological influences. These psycho-social factors may, and very likely do, interact with each other to a large extent. Such interactions may be too complicated to measure. There is, in addition, an influence from variation and error in measurement of the factors selected, as well as an influence from the difficulty of measuring clinical severity, which may be an intractable problem. At a wider level recovery time must have a large amount of inherent unpredictability unless one has measured every possible variable that would be relevant to the population under study. Accounting for 30% to 40% of the variance in recovery time is, however, a good result and it helps to clarify some of the biases about and misperceptions of convalescence. The remaining 60% to 70% which is left unaccounted for emphasises the fact that there are clearly many other variables which are influencing recovery time which have not been measured here. These would include iatrogenic influences, or the unique and individual circumstances of the officers. The second prospective study (Chapter 9) allows a further test of some of these same factors, and the inclusion of some other predictors.

Chapter 8: The Lockerbie Disaster.

Abstract.

During the time period that this project on injury recovery was being conducted a major civilian air disaster occurred in Scotland. In December 1988, a bomb exploded on board a Pan Am jet, murdering all 259 crew and passengers and 11 people on the ground. The wreckage from the aircraft covered an area of 840 square miles around Lockerbie and southern Scotland. This area is policed by Dumfries and Galloway Constabulary, a force of just over 300 officers. The scale of the disaster necessitated assistance from neighbouring forces and over 2,000 Strathclyde police officers (almost 50% of the force) were involved. This event and its consequences constituted the largest murder investigation and recovery operation in the history of British policing. This Chapter reviews research which was conducted within the force to measure the psychological and physical health of Strathclyde officers who performed duty at the site. It is included in this thesis for several reasons. The Lockerbie disaster was an event of significant proportion for the officers, some of whom were subjects in the injury study. The aftermath of the event had implications for the provision of health and welfare services for the officers in general, and is also of relevance to any study of injury and sickness absence in police officers. More detailed reports of the research (Mitchell et al., 1991) are referred to throughout the Chapter. As a consequence of this research at Strathclyde, the officers and the management became more 'psychologically literate' since the issue of acute occupational stress was being discussed more openly. Twenty of the officers in the second prospective study had been exposed to body handling duties at Lockerbie and the effects of this were analysed in terms of recovery rate after the injury. Findings from the Lockerbie research are discussed as they pertain to early intervention and the rehabilitation of officers.

8.1 The relationship of the Lockerbie research to the injury study.

This summary of the research reflects a very small part of the findings and is brief because of its limited direct relevance to injury recovery, the report of the research

is included in recognition of the significance of this event to Strathclyde police. At the time the injury study started there was great suspicion of psychology and what psychologists do although the amount of psychological research into stress in the police was increasing. In Scotland, however, there really had been no research done although a study at Grampian police on stress and illness had been started (Alexander, et al. 1991). During this time also, there were many civilian disasters (the Kegworth air crash, the Clapham rail crash, and the sinking of the Herald of Free Enterprise amongst others). These raised the public perception of the role of the emergency services in disaster recovery.

This was especially true for the police who were very heavily involved in the Lockerbie disaster as a consequence of its being a murder rather than an 'accident'. The number of police officers within this force who performed duty at Lockerbie and the extremity of the conditions under which they were working, forced attention on the potential for large scale effects on their health. There is little likelihood that this research could have been carried out had the injury study not already been in place. The Medical Department and the police authority already had a psychologist *in situ* with whom they were familiar which meant that permission was relatively easily obtained from the Chief Constable to carry out the research.

Police officers are generally expected to cope with more distressing duties with a mixture of black humour and alcohol. These sorts of strategies were clearly insufficient for what they had to deal with and, indeed, their true effectiveness in anything other than the short term is questionable (Paton and Mitchell, 1990; Mitchell, 1990c). The officers, of course, knew that the Lockerbie research was being conducted and this had a somewhat therapeutic side effect. The eventual publication of some of the results allowed officers to talk about their own reactions more easily, by having something objective and 'out there' to talk about. This allowed discussion with less of the usual cover of bravado which typically obfuscates the real issues. That discussion was important was made evident by the fact that officers who were interviewed in the second injury study were very anxious to discuss their experiences. This they did in a highly emotional way, and

a striking characteristic of these conversations was the number of questions that the officers still had about the operation. This natural response reflecting the valuable post-traumatic therapeutic strategy of disclosure (Pennebaker, 1988). They were very clearly still disturbed some six to seven months later. As alluded to above this was interpreted as the officers' still trying to make sense of the event and attributing meaning both to the event and to their own role in it.

The sheer number of officers who had been involved precluded the possibility of structured debriefing after their duty, and perhaps at the time of Lockerbie the necessity for this support strategy was not yet obvious. From the point of view of protecting the health and welfare of the workers, there are significant differences between those officers who have been debriefed and those who have not (Thompson, 1991). This research on the effects of duty at Lockerbie on police officers is thought to be the largest study of emergency personnel after an acute stressor, and it has made a substantial contribution to comprehending the psychological reactions of police officers and preparing for them. The question of how to train or prepare officers, and other rescue workers, to deal with the practicalities of this type of work is of interest. Some early results of the injury study were included in a proposal for the implementation of an Occupational Health Unit to start towards the end of this year (1991). These and the aftermath of the Lockerbie disaster has changed many attitudes towards protecting the health of police officers and providing appropriate support for them. So, during the time that the injury study was being conducted the whole context of occupational health for police officers changed radically.

8.2 The Lockerbie disaster and the involvement of Strathclyde police officers. The Lockerbie disaster occurred while the injury study was being conducted and resources were diverted into the recovery effort and the injury study was interrupted for a period. On the 21st of December 1988, a bomb exploded on board a Pan Am jet flying 31,000 feet en route from London to New York; as a result wreckage, cargo and human remains were strewn over an

estimated area of 840 square miles around Lockerbie and southern Scotland. Two hundred and fifty nine crew and passengers and eleven people on the ground were murdered. Since it was a criminal investigation, very large numbers of police personnel were required to gather forensic evidence, move and document the bodies and, with other recovery workers, return the town and surrounding area to order. In addition to the officers from Dumfries and Galloway and Strathclyde, officers from other British forces were involved including Lothian and Borders and the Metropolitan Police. The Armed Forces and Dumfries and Galloway Fire Brigade were also involved in immediate recovery work. A team comprising Scottish Criminal Investigation Department officers, US Federal Bureau of Investigation agents, and German special investigative officers carried out the criminal investigation. It is estimated that on any one day in the few days following the disaster there were over two and a half thousand emergency workers at the site. The involvement of Strathclyde personnel alone amounted to over 2000 officers at the site and a further 500 officers and civilians in directly related tasks at the Incident Control Centre at Lockerbie and at Police Headquarters in Glasgow.

On the first night, several buildings were on fire and emergency services had been rushed to the area although there was little to do to preserve life. On the ensuing days, the most salient feature for the officers was the scale of the disaster: the number of casualties, the size of the affected area and the extent of the devastation. There were five areas in the town in which there had been an impact, and each was different in character. In some there was fire damage, in others only debris. The vast amount of wreckage was described as 'incomprehensible', and the devastation as 'beyond belief'.

Police officers were detailed three main duties at the site: mortuary duty, line searches for evidence and patrol and security of the various sites. Officers were exposed to body handling both in the mortuary and during searches. In the mortuary they attended and recorded evidential details of the post mortems. In view of the very large number of dead they were also required to move the bodies and prepare them for the various phases of the post mortem procedure. In contrast to

the consistent exposure that the officers working in the mortuary experienced, those on search duties suffered a form of anticipatory anxiety because they never know what they would come across. Each piece of human and other forensic evidence had to be located, documented and photographed, and preserved for evidential purposes. Patrol and security duties were also demanding. There was great pressure from the media and sightseers, as well as from the relatives of the victims wishing to see the areas of impact and where their loved ones died. The necessity to protect criminal evidence at the various sites, meant that the job of patrolling these areas was demanding, involving fairly aggressive dealing with the media and the sightseers, and very sensitive handling of the bereaved.

It was mostly regular beat constables who attended the site. The question posed in this research into the effects of duty at Lockerbie concerned how psychologically prepared they were to deal with the quite extraordinary tasks necessitated by the atrocity. At the time of Lockerbie, both the police authority and the officers themselves believed their training and on the job experience was adequate preparation. It became increasingly obvious as time went on, however, that the tasks were not like any previously experienced. One officer said,

'My experiences over the years have seen me become accustomed to tragic situations but I was ill prepared for the situation I faced at Lockerbie. I have had wide dealings with sudden deaths and post mortems but nothing could prepare me for what I had to do'.

8.3 A summary of the research that was carried out on the health of the police officers who attended the Lockerbie site. The extreme nature of the recovery operation, and the number of officers involved required research to be carried out to calibrate the health impact. Attention was focussed on how demanding police work can be and the results of the research led to a questioning of some implicit assumptions about police officers', and other emergency workers', immunity to effects of these demanding duties (Mitchell, 1990c). Most previous research on trauma has concentrated on the immediate

victims or their families. The number of rescue workers who have been involved in recent disaster recovery work in Britain, however, has drawn attention to the particular experiences of those whose job it is to deal with these extreme human situations. At the time of the Lockerbie disaster there was a prevalent assumption that workers, including police officers, could cope with unusual duties and emerge unscathed. The perception of how emergency workers cope is changing as a result of recent research on disaster workers (Paton, 1989; Turner et al., 1989; Mitchell et al., 1991; Taylor, and Fraser 1982) to the extent that emergency workers who attend disasters are now recognised as victims (British Psychological Society, 1990). Having established that emergency workers are affected by their work, it is important to not make assumptions that the cause of their distress is solely the traumatic and horrifying sights involved. If it were, then the only conclusion that could be reached is that people should not be exposed, which is not a useful insight if working around such things is part of one's work.

One aspect of the research which is summarised in this Chapter aimed to find out what the most troublesome aspects of the work were (Section 8.6). This sort of analysis can inform how to plan training and support for police officers. Quantitative analyses were carried out which considered the short and longer term health effects on the officers. The aim of the first of these was to find whether the amount of exposure to body handling was related to short term measures of distress (psychological symptoms, self report of physical symptoms, and the degree to which the officer still thought about the work some weeks afterward, Section 8.7). A group of officers (n = 190) who had worked in the mortuary were studied in greater detail, and one aspect of this considered whether less exposure by being rotated out of that duty was protective (Section 8.8). The longer term sickness absence in this group was also examined (Section 8.9), the data for the analysis was obtained by comparing the health records of officers in 1989, the year following the disaster with their records for 1988.

8.4 Method. Three to four weeks after the disaster, questionnaires were sent to all personnel who had been involved. In choosing a means of collecting data,

certain considerations were borne in mind. The potential number of participants meant that interview was impossible. The speed with which the data had to be collected to obtain a measure as soon after the event as possible, was a further constraint. In view of all these considerations, a self report questionnaire (Appendix HH) was designed for the purpose. Within two weeks of their being sent out, 948 completed questionnaires were returned to the Medical Department (48% of the target sample of police officers). The response rate compares well with community surveys and with other studies of police officers (e.g. Duckworth, 1986 after the Bradford Football Stadium Fire, 58%). Failure to achieve a high response rate is a problem in research with police officers who are generally suspicious of inquiries into their psychological status.

8.5 Measures. Several self report measures were used to assess the short term impact of working at the site. In accordance with similar research on police officers on duty at the Bradford Fire (Duckworth, 1986), the General Health Questionnaire was used (GHQ-12, Goldberg, 1972) to measure the level of psychological distress. It is described elsewhere in the thesis (Section 4.2). .

The large numbers of officers involved precluded a physical examination of every officer, so the only way in which some measure of physical distress could be obtained was by asking about common physical ailments which they may have been experienced. The item in the questionnaire was presented as follows: 'There is no reason to expect that you would have experienced any physical complaints while working at the site or afterwards, but have you had any of the following that you attribute to the work you did? The list of symptoms were: upset stomach, headache, nausea, tightness in the chest, loss of appetite, or sleep disturbance. In the literature, acknowledging physical symptoms such as sleeplessness, appetite loss and headaches is often taken as an indication of felt stress (Wolfenden, *undated*). A total physical symptom score was obtained by summing all the symptoms acknowledged.

As a further measure of the impact of the event, the officers were asked to rate how much they still thought about the event (about a month to a six weeks afterwards) when completing the questionnaire. The question was posed, by asking 'How much do you presently think about the work that you carried out at the site?' The responses were on a four point scale, from 'don't think about it at all' to 'can't stop thinking about it'. Officers were also asked, if they did think about the event, what was it in particular that they thought about. Further qualitative data was obtained by content analysis of the material in these responses.

Table 8.5.1
Variables measured by the questionnaire.

Variable	How it was measured
Psychological symptoms	General Health Questionnaire (30 item)
Physical symptoms	Checklist of physical symptoms
Intrusive ideation	Rating (on four point scale) of degree to which images and experiences were thought about after the event

Two sections in the questionnaire invited the officers to write freely about their experiences. These narratives provided material from which to obtain an understanding of the main themes of the officers' perception of the work.

8.6 The sample. No record existed within the Police administration of which duties at the site had been performed by particular officers. since work detail was given out at the site. Reliance had to be placed on the officers' own estimates in a section of the questionnaire (see Appendix HH). From this information, the sample was classified according to the three main duties at the site. For the purposes of analysis, officers were assigned to the duty groups according to where they had spent 'all' of their time (defined as over 80% of their total time at the site) or 'part' of their time (defined as 79% and less of their total time at the site). Table 8.6.1 shows the sample sizes of the three groups.

Table 8.6.1

The study sample separated into three duty groups.

Duty	N size	Percent of sample
Mortuary	228	26
Search	389	45
Patrol & Security	248	29
Total	865*	100%

* 83 officers were engaged in administrative duties only excluded from the total sample (n = 948).

Each study is reviewed below starting with the qualitative element of the research.

8.7 What were the important aspects of the work for the officers?

Before presenting the comparison of the three groups who carried out the different duties at the site on the three outcome measures (psychological symptoms, physical symptoms and the amount of intrusive ideation), the qualitative aspect of the research will be discussed (Mitchell and Boddy, 1990). Content analysis of the written narrative sections of the questionnaire formed the main source of information for this section. In addition, while conducting the structured interviews for the second prospective study, the twenty officers who had been exposed to traumatic duties at Lockerbie talked about their experiences. This topic was brought up spontaneously by the officers, seeming to have a need to talk, often at great length, about their work at the site. These interviews took place six to ten months after the disaster. The officers still had many questions about the work, the cause of the disaster, its consequences and their own role in the recovery operation. These

informal interviews allowed a better understanding of the content of the written narratives, and pointed towards an interpretation of their experience in cognitive terms. The results generally indicated that while the officers considered the work to be 'part of the job' it was not easily assimilated nor dealt as easily as might be expected. While traumatic imagery provided the material for subsequent intrusive thoughts and produced classic post traumatic stress reactions, other elements peculiar to working at the site concerned such issues as rendering the experience personally meaningful (Mitchell and Boddy, 1990; Paton, 1991; Janoff-Bulman, 1988)

Each disaster has unique characteristics and unique demands for recovery crews, but Lockerbie in particular belongs in a category of its own. The way in which the victims died was quite unlike anything previously experienced by the officers, the fatal injuries were, as one officer described them, 'quite unimaginable'. The fact that Lockerbie was not a natural disaster but a large scale murder lent an atmosphere of frustrated anger to the entire operation. Certain characteristics of Lockerbie such as these may have rendered the disaster extremely hard to come to terms with, and the characteristics which emerged from the narratives are summarised in Table 8.7.1

Table 8.7.1
Characteristics of Lockerbie from content analysis of the officers' narratives.

1. The scale of the disaster.
2. The physical chaos of the site.
3. The circumstances in which the innocent victims died.

The most frequent themes were to do with the scale of the disaster in terms of the size of the aircraft, and the chaos of strewn cargo and bodies. Peculiar images, such as the large hole in the road where one of the engine cowlings had sunk on impact, were very hard to assimilate. Officers searched these areas for forensic

evidence and preservation of possible evidence meant that these sites had to be left untouched for several days, while documentation was completed. Sixty per cent of the respondents commented on the extent of the physical devastation, the number of dead and the degree of destruction. The chaos and the extent of the damage led to feelings on the part of the officers that the whole recover operation was out of control. Such perceived loss of control over one's physical environment can be related to increased levels of felt stress Fisher (1984) , and that a sense of mastery over one's environment is important to psychological health. Increased stress can also result when attempts to restore order are frustrated (Raphael, 1986). The nature of the tasks at the site and the deployment of groups of officers to particular areas meant that they could not be active at all times, and the frustration of having to wait for orders was mentioned by several. Raphael (ibid.) describes that some sort of physical activity is important in disaster recovery work to restore a sense of power and control over disorder. A common psychological reaction in workers at disaster sites is to feel useless and hopeless (Raphael, ibid.; Duckworth, 1986; Paton, 1991). At Lockerbie there was no-one to save, and there seemed to be little positive to be done, one officer commented,

'I experienced a feeling of hopelessness due to the fact that all the boys seemed to be doing was 'hoovering' or cleaning up the countryside around Lockerbie, 'I felt an inability to do anything worthwhile. You knew everyone was dead and there was no chance of rescuing anyone and the persons responsible for the mass murder would be almost impossible to identify.'

The scale of the disaster and the circumstances of it made it very hard to assimilate into any previous experience: the cause of the Lockerbie disaster (a bomb, Middle East terrorism) was quite out of the ordinary experience of most of the officers directly involved in clearing up the consequences. From the content analysis while it is certainly the case that traumatic imagery contributed to the distress of the experience, it would appear that the inability to assimilate the experience may have been a particularly important aspect. Attribution theory suggests that people need to explain sudden threatening events to themselves to

provide a reason why these events happen (Brewin, 1988). Antonovsky (1979) proposes that people become vulnerable to psychological ill health if they are unable to render a new situation cohesive and meaningful.

The fact of being unable to derive some sense of justice about the event also contributed to the officers' difficulties. The passengers were travelling home or to visit friends for Christmas, and their complete un-preparedness and innocence denied the possibility of rationalising that they were in any way the authors of their own circumstances (the Just World Hypothesis, Lerner, 1980). As a reminder of the time of year, the searchers found Christmas presents from the plane on the hillsides, one described 'a particularly depressing image that (he couldn't) get out of (his) mind: a child's present with a label on it "not to be opened until Christmas".' The enormous waste of life was deeply shocking, and the officers were in contact with the relatives and the bereaved, 'In interviewing the relatives, I will never forget the sadness, shock, horror and disbelief on the faces of the American relatives and of the people of Lockerbie.'.

The way in which the victims died was a major source of worry and concern to the officers, one commented,

'I thought all the time about how the victims must have suffered and whether they were aware of what was happening to them and I couldn't get rid of the image of bodies, and young children falling from the sky.'.

These same images were recalled and the same worries were expressed months later during the interviews for the injury study. There was little indication that these issues had been assimilated or put to rest with the passage of time.

That the loss of control and the inability to render the experience meaningful were sources of stress, is evident from the many criticisms of the recovery operation by the officers. This sort of anger against the authorities and the frustration and not being able to just get on with the job is a very common reaction to disaster work (Duckworth, 1986). By any objective standard, the operation had

gone very well (AAIB, 1990), given the magnitude of the event. In terms of the officers' coping with the event, their *perception* of the operation in terms of its organisation and their role in it is more important than the reality. The officers' criticisms were interpreted as reflecting a heightened need for order rather than a criticism based on realistic considerations of the requirements and constraints of the task at hand (Mitchell and Boddy, 1990).

It is clear from the commentary of the officers that they neither approached the work as mere functionaries, nor left it satisfied with their own contribution. They had strong needs for cognitive assimilation, to ascribe meaning to an existentially challenging experience and to exert control over the chaos they observed. As behavioural corollaries of these perceptions, emergency workers have been observed to suffer guilt over their performance, a feeling that they have not done enough and anger at the authorities (Duckworth, 1986). The psychological needs of the officers point the way to preventative health strategies which can be put in place, and to what interventions may be appropriate to offset the most severe effects. These are discussed in Section 8.8. Specifically in regard to the experience of Strathclyde officers, attempts to cope with the impact of Lockerbie were limited because of the sheer numbers involved. The fact that some officers still had very basic questions about the event, and about their own role in it supports the finding from other research (Paton, 1989, 1991; Thompson, 1991) that regular dissemination of information during operations and post incident debriefing are required and are probably protective against psychological ill health. The inability to debrief within Strathclyde force, or perhaps the perception that it was not necessary, may have contributed to the resultant health effects described below.

8.8 Short term health effects. The main purpose of this component of the study was to find whether duty at Lockerbie was distressing for the officers by the measures selected, and if any of the duties were more distressing than others. An hypothesis of this part of the research was that the more direct body handling required the greater would be the emotional impact.

In terms of the measure of physical symptoms, mortuary workers acknowledged more symptoms than the other two duty groups ($t = 5.12$; $p > .0001$, compared with those on search duty). Those on line search duty acknowledged more symptoms than those on patrol ($t = 2.12$; $p > .01$). Disturbance of sleep was acknowledged by nearly 30% of the sample, and by 43% of those who had worked in the mortuary. The other physical symptoms reported by the mortuary workers, such as headaches, nausea, or stomach disorders, may also have reflected the degree to which these officers felt exposed to health hazards, such as body fluids, or strains resulting from the physically arduous body handling that was required.

It is suggested (Pennebaker, 1988) that the degree to which trauma victims continue to think about something reflects the degree to which they have failed to assimilate it. This can be measured in a number of different ways (Horowitz et al., 1979) but a very straightforward measure was adopted with this sample of police officers. Comparing the three duty groups, officers who worked in the mortuary thought about the work they had carried out significantly more than did those on patrol duties ($t = 3.09$; $p = .002$). Similarly, those on search duties reported thinking about their work significantly more than did those on patrol work ($t = 2.02$; $p = .04$), who reported the least. Officers working on patrol duties acknowledged that they thought about the event very little, while those on the other two duties thought about it quite a lot. The equally high levels of ideation about the duties was interpreted in that search duties had involved an inconsistent degree of exposure in which there was concern on the part of the officers about the possibility of finding something very disturbing. In terms of exposure the reduced amount of it in comparison with the higher levels of it in the mortuary would lead to the expectation that it would be less distressing. As will be described in Section 8.8, it may be the form that the exposure takes rather than the sheer amount which is problematic.

The groups were then compared on the level of reported psychological symptoms using an analysis of variance of the scores on the GHQ-12. There was no difference between the three groups ($F = .214_{2,899}, p = .81$) on the level of symptoms. Considering that the physical symptom scores and the ideation scores were higher in the mortuary groups, this finding is a surprise. It may be that while acknowledging physical symptoms is considered to be quite appropriate within the police culture, acknowledging psychological symptoms is not. The purpose of the General Health Questionnaire is very obvious, if a respondent does not wish to acknowledge psychological distress it is easy to answer the instrument in this way.

8.9 The short term health effects on officers who worked in the mortuary according to whether they worked full time or part of the time. Working in the mortuary was the most demanding job according to the above analyses, and this was assumed to be the result of the greater amount of body handling. One would expect that to rotate officers out of this job would reduce the degree of exposure and would be preferable. To find if this was the case, the sample of mortuary workers was divided into those who had worked there most or all of the time (80% and above of their total shift), and those who had spent part of their time at other duties, (defined as 79% of their time or less in the mortuary). The two groups so formed were compared on all outcome measures. Those who worked consistently in the mortuary reported significantly fewer physical symptoms than those who were rotated through other jobs and worked there for only part of their time ($t = 2.35, p = .02$). The same analysis was carried out comparing the amount the duties were thought about four to six weeks later. Again, the amount that the event was thought about was significantly less in those who had worked in the mortuary full time rather than part time ($t = 2.86, p = .005$).

The groups were also compared on the level of psychological symptoms measured by the GHQ-12. Part time workers acknowledged more psychological symptoms, although the difference was not significant ($t = 1.44$, $p = .076$), so short periods of exposure in the mortuary did not protect workers from potentially

harmful effects. These findings are counterintuitive if one thinks only in terms of exposure to trauma, but their interpretation is assisted by interviews with the officers who had worked in the mortuary. It was explained that being in the mortuary for longer provided an opportunity to understand the process of the forensic examinations and to become intellectually absorbed in the inquiries. There was more of a sense of a contribution to solving the crime, and of making some sense of their own role in the event. In contrast, those who were in the mortuary for a short time, carrying out what can only be described as labouring work, did not have an opportunity to assimilate what they were seeing, and would have been struck, as one officer described it, by 'the sheer enormity of being in a room .... filled with so many dead people.'. If one knows that the officers needed to make sense of what they were doing, and understand their contribution to the process, the findings are completely interpretable.

8.10 Longer term health consequences for officers who worked in the mortuary: sickness absence in 1988 compared with 1989. Working in the mortuary was obviously a demanding task, according to the measures of physical symptoms and the amount of ideation. A further study of the health sequelae for 190 officers who had worked in the mortuary. Their health records from the year before Lockerbie (1988) were compared with their own records for the year after (1989). The Lockerbie disaster occurred in December 1988 and so a complete calendar year of health records could be compared. In this way the officers acted as their own controls. In analysing the health records the question was whether there had been a rise in sickness absence following duty at Lockerbie. Absence from work can indicate psychological as well as physical ill health (Wolfenden, *undated*). The group of 190 officers were off work for all reasons (illness and injury) in 1988 for 1,722 days and in 1989 for 2,974 days. This represented an increase of over 70% (1252 days). Figures for sickness absence within the force fluctuate from year to year, but to put the above figure in perspective, there had been an overall increase in sickness absence within the force between 1988 and 1989 of almost 5%. This figure is clearly far lower than the increase for the sub-set of mortuary workers.

Such figures are more meaningful when broken down into the various different reasons for absence. The usual division is into absence due to 'illness' and absence due to 'injury', and then further into short term (or medically uncertificated for periods of 7 days or less) and longer term (8 days or longer requiring a medical certificate). The absence due to injury was also broken down into injuries as a result of on or off duty incidents. Tables 8.9.1 and 8.9.2 show the increase in both short term and longer term illness absence in the year following duty at Lockerbie. Not only is there an increase in the frequency of taking short periods of time off work, there was also an increase in the consequent total absence. Although there was a large overall percentage increase in absence due to certificated illness, this difference is not statistically significant.

Table 8.10.1

Annual short term illness absence before and after duty at Lockerbie for the sample of (n = 190) mortuary workers.

Year	n	Days	
1988	139	453	
1989	176	623	Percentage change + 37.5%

$t = 2.92$, $p = .001$

Table 8.10.2

Annual medically certificated illness absence before and after duty at Lockerbie for the sample of (n = 190) mortuary workers.

Year	n	Days	
1988	31	639	
1989	22	783	Percentage change + 22.5%

$t = .54$, $p = \text{ns}$

A few of the officers who worked in the mortuary had sustained injury either on or off duty in either of the years: the frequency of off duty injury incidents increased from 31 in 1988 to 45 in 1989 ($t = 2.07$, $p = .025$), and the length of time taken off convalescing from these injuries almost doubled from a total of 490 days to 968 days ($t = 2.45$, $p = .0076$). This implies that along with the increased frequency of off duty injury incidents, the injuries sustained were more serious. No detailed analysis has yet been carried out to ascertain the specific circumstances of the incidents in which the officers were injured. Cognitive dysfunction which may be the result of felt stress can lead to increased alcohol consumption or even driving less carefully (Connolly, 1981; Billings and Moos, 1983; Reinecker and Zauner, 1983). In the present sample 7% sustained an on duty injury, while 24% sustained an injury off duty; there was also an increase in absence due to on duty injuries. This was, however, considered spurious in view of the very small sample size (9 injuries in 1988 compared with 13 injuries in 1989). Nevertheless these 13 injuries accounted for a loss of 600 working days in contrast to the nine injuries in 1988 which accounted for only 140 days. The mean length of absence for each injury is significantly different for the two years ($t = 1.81$, $p = .05$).

8.11 Conclusions. In common psychological parlance the research problem posed by an event of this sort is to study how normal people react in abnormal circumstances. The practical contribution which psychologists make to this field is to calibrate and identify typical reactions to trauma, in order to inform the design of support programmes. The whole issue of psychological reactions in those who are employed to deal with the harsher side of life has been confused, and up until the last few years has not been openly discussed. This is easily understood if one knows that soldiers in the First World War who suffered the similar syndrome of 'battle shock' were summarily shot. The denial of psychological distress which is still evident in many emergency services is a much modified but thematically similar version of this same severe approach. Among employers in these services there may be a fear of allowing psychological distress to be legitimised in case this leads

to an increase in incidence (Mitchell, 1991). To design support programmes that are compatible with this work setting is a challenge for psychologists.

Recent large scale disasters have allowed the examination of reactions to disaster work in very large numbers of people. Typically, such reactions can only be studied in individuals, since trauma is more usually an individual phenomenon such as a rape, or an assault. Also, many cases which have been studied are self selected on the basis that they have come to attention through their seeking assistance for psychological distress. The fact of so many employees being faced with trauma has changed that to a degree, and studying larger groups allows a better insight into the great variation in human response. While some are adversely affected by their experiences some appear to fare well and to cope, at least according to the psychometric methods used or the criteria of distress adopted in various studies. Why is it that some emergency workers seem remarkably resilient and able to withstand trauma while others succumb and suffer severe and chronic difficulties? From an organisational point of view the differences appear to be due to the context in which these duties are carried out.

Mass exposure of disaster workers requires a more informed approach to this particular aspect of acute occupational distress, since it is necessary to protect the resource of trained and dedicated frontline emergency workers. The results of research in several studies of reactions to such exposure, have presented a far more benign picture than that supposed or expected. It appears that people show remarkable resilience and by no means all manifest stress reactions. More importantly, while random individual factors have a bearing on how a particular person will react, there is plentiful evidence that organisations can do a great deal to offset the potential for harm by creating an appropriate supportive context (Thompson, 1991; Alexander and Wells, 1991).

Chapter 9: Second Prospective Study.

Abstract. The aim of the second prospective study was to investigate the influence of the same group of predictors on length of absence in a separate sample. In addition, new variables which measured some reaction to the experience of convalescing were included, as was a more detailed measure of job satisfaction. The officers (n = 53) in the study were physically examined a mean of 11 days after injury. Likely recovery times for the injuries were estimated based on the results of an independent clinical examination. One subject was excluded as an outlier and and so analysis was carried out on a sample size of 52. The most important elements of the model generated in the first study were replicated. This study confirmed the importance of culpability, and a number of other social and psychological predictors in influencing recovery time after injury. It also confirmed that predictors of recovery from on duty injury differ from those for off duty injury. Differences between the findings of the first and second prospective studies are discussed in terms of the method used for data collection, which was a semi-structured interview in this study instead of a questionnaire.

9.1 Introduction. The results of the second study are separated into two broad parts. The first part describes the application of the previous regression model to this second set of data to test its robustness in predicting rate of recovery. The second part of the Chapter describes the analyses of the new variables.

The present study differed from the previous prospective study mostly in the respect that a semi-structured interview was used to collect the data. It was thought that the use of an interview might allow measurement of more subtle influences on recovery time. In epidemiological studies, such as that by Brown and Harris (1978) on the social origins of depression, the use of a semi-structured interview is preferred. This is because, in an interview, the interviewer can explain the intent and meaning of certain questions thereby reducing error in measurement due to ambiguous questions.

9.2 The rationale for the predictors included. As in the first study, the officer's history of ill health absence, his (all the subjects were male) affective state, and his perceptions of causal responsibility and culpability for the injury incident were measured. Affective state was measured by the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983). Perceptions of causal responsibility and culpability for the incident were measured using the scale devised by Brewin et al. (1983). It was found from the analyses reported in Chapter 7 that job dissatisfaction did not contributed to explaining recovery time. This may have been the consequence of the way in which the variable had been measured. In view of this possibility, a more detailed measure of job satisfaction was used (Warr, 1979). Other new variables were included in the interview used in this study (Appendix F), and are described as follows.

One important reason for having selected a sample from a single employer was to control for sources of variation not central to the aims of the thesis. One factor which had been shown to be an important predictor in the study by Brewin et al. (1983) was the receipt of income support. This is possibly less interesting from a psychological point of view although it is recognised that even within a relatively narrow socio-economic band, there are likely differential financial pressures. To measure if there is any influence from this source, a measure of 'financial solvency' was included (Fryer, 1986). Even although the officers are all on more or less the same pay level, being off work means that they are ineligible for overtime payments which are an expected part of normal pay. It was proposed that those who felt under pressure financially would, for this reason, want to return to work more quickly. It was also proposed that the more tension and interpersonal dissatisfaction there was at home, the faster would be the return to work. A rating of tension in the home and the degree to which the officer felt that he was 'living up to expectations' and 'keeping the people at home cheerful and contented' was included as a measure of tension at home.

The change occasioned by being injured and having to stay home means that

the officer will suddenly not have the structure of work to occupy his time. He will have an unusual amount of spare time in which to carry out tasks that he has perhaps been putting off for a long time. Officers may plan to study for their exams while convalescing, but it is an unfortunate phenomenon of being without the pressures of deadlines and the structure of work that, with all the time in the world, people often cannot plan their day or use their time in a productive manner (Bolton, 1984). Bolton hypothesised that 'the experience of filling time productively depends on engagement in long term intended action', such as is afforded by regular work (Bolton and Oatley, 1985). When depressed, she proposed, one is less able to fill time and manage it and one becomes 'time's slave' rather than 'time's master'.

So, the two go hand in hand, the loss of long term intended action and the progressive depression as one feels less able to manage time productively. The ability to manage time was conceived in Bolton's study of the unemployed as being a dimension of personality, some people are better at it than others. Those who are able to manage their time without the external structure of a job are less likely to become depressed. The present research does not consider the development of depression during convalescence, but does propose that an inability to manage time without the structure of work would be related to an accelerated return, other important factors considered. The officer who felt aimless would also feel increasing dysphoria, as suggested by the findings of the cross sectional study (Chapter 5) which might lead to an urge to return to the structure of work. Bolton constructed a measure of 'Time management' in five dimensions developed factor analytically: 'self motivation'; 'ease with time'; 'mastery over time'; 'regularity of rising' and 'the predictability of the future' (Bolton, 1984). A perceived lack of structure in the day and an inability to use time in a useful way were found to be a problem for the unemployed (Section 2:6) and were related to the onset of depression. For the convalescent, of course, there are additional physical restrictions on what they are functionally able to do (Mitchell, 1990b). The Bolton measure was included to find whether the ability to manage time according to the

five factors of time management had an influence on recovery time.

The officers were interviewed about any aspects of their work that they missed while being off convalescing. That convalescence may share many of the psychologically distressing features of unemployment was the basis for applying this other concept developed to account for the phenomenology of unemployment. Jahoda et al. (1972) proposes there are other aspects of employment, beyond obtaining money, for which a person goes to work. These are to do with feelings of self worth, structure and social contact, which Jahoda called the 'latent functions of employment'. It is proposed in the present study that convalescence also involves a deprivation of these latent functions.

During the interview on threatening life events, it emerged that almost 40% of this sample had attended duty at Lockerbie. Not all of the duties at Lockerbie were traumatic. Depending on whether the officer was exposed to body handling at Lockerbie, he was included in an 'exposed' group or a 'non-exposed' group. In total, 20 of the total sample of 52 officers were exposed (8 in the on duty injury sample, and 12 in the off duty injury sample). Work such as that required at Lockerbie is a very rare experience, and Tirril Harris (Brown and Harris, 1978) agreed to rate the 'Lockerbie events' experienced by the officers. She considered the events to be 'traumatic', and high in short term threat but lower in long term threat (rated a '3' on the Brown and Harris scale of threat of events, Brown and Harris, ibid.). Since the long term threat was not considered severe, these exposures could not be included as a 'work related life event' in the index of threatening life events. It was nevertheless considered by the officers as being a significant experience and the possible influence of exposure on the rate of return to work was analysed.

The interview schedule is included in Appendix F. Table 9.2.1 lists the predictor variables applied in the first prospective study, while Table 9.2.2 includes a list of new variables applied only in this second study.

Table 9.2.1

Eight predictor variables common to the first and second studies.

Variable name	What it measures
Previous illness absence	Sum of previous short term absence: 7 days or less each absence; previous medically certificated absence: 8 days or more each absence, divided by the length of service
Previous injury absence	Sum of previous absence due to on duty injuries and previous absence due to off duty injuries, divided by the length of service
Anxiety	Hospital Anxiety Scale
Depression	Hospital Depression Scale
Life events	Threat of life events in year prior
Age / Service	Age / Length of service
Culpability	Attribution of culpability for the accident
Causal responsibility	Attribution of causal responsibility for the accident

Table 9.2.2
Additional measures

Variable name	What it measures
Social support at home	A rating of tension in the home and two questions concerning feelings of adequacy at home.
Financial solvency	A rating of ability to meet financial commitments
Job satisfaction	Measured according to 16 aspects
Work commitment	A measure of the degree to which work is central
Latent functions of work	Six latent functions of work to do with social contact, structure and identity
Time management	13 individual items summed to form 5 separate scales

9.3 The hypotheses. The particular hypotheses of this study are based on the findings of the first prospective study, and on other research.

Hypothesis 1. To be injured on duty is phenomenologically distinct from being injured off duty and the factors relevant to rate of recovery from one are different from those important in recovery from the other.

Hypothesis 2. The attributions which the person makes about the accident will influence recovery rate, but only for on duty injuries.

Hypothesis 3. Those who are dissatisfied with their jobs will take longer to return to work than those who are satisfied.

Hypothesis 4. Those who acknowledge interpersonal tension at home will return to work more quickly than those who do not.

Hypothesis 5. Traumatic exposure at Lockerbie will be associated with a longer than expected rate of recovery.

Hypothesis 6. The ability or inability to plan activities and use time in a useful way will influence the rate of recovery after injury.

9.4 Method. The subjects were obtained in a manner very similar to that in the first study. The nursing sister in the Medical Department screened the incoming sickness absence forms for likely candidates, checked that they were still absent one week later, and then passed the forms to the author, who made the initial telephone calls. This presented something of a problem in that not all the officers who were telephoned had heard of the research, although the Police Federation (who funded the research) had included material about the research in their circulars to members. These initial telephone calls could not be made by the Department nursing sister since the additional work involved in doing so in the first prospective study had proved a strain. Quite understandably she was unwilling to take on the task again. Nor could the initial telephone call be made by the nursing sister hired for the second phase of the project, since she was not in any way associated with Strathclyde Police. The officers would have objected to being contacted at home by

a person who was quite unknown to them. The research was fully explained in these initial telephone calls and their agreement to participate secured.

During this first telephone call an arrangement was made to interview the officer at his home or at Headquarters. The officer was advised that the nursing sister would be in touch to arrange a physical examination. It was observed that there had been some confusion on the part of the officers about the aims of the research in the first study. This may have stemmed from the use of the Police Medical Department nursing sister to carry out the physical examinations. In the interests of getting the research done with very limited financial resources this less than ideal arrangement of using the police nursing sister had been settled upon. In the present study, however, one was able to present the research as being entirely separate from the workings of the Medical Department. Physical examinations were carried out according to the detailed Clinical Pro-forma designed for the research (Appendix J).

This method of parallel assessment in obtaining physical and psychological measures in a sample of officers who were injured at different times, and who lived all over the Strathclyde region, proved almost unworkable. Many different ways to streamline the operation were attempted, among others running an evening clinic in the Medical Department, and having some of the officers examined and interviewed at the nursing sister's other place of employment. Each of these attempts was frustrated by the inherent logistical problems of arranging two interviews and one clinical examination, carrying them out and coordinating these activities as much as possible so as to not inconvenience the officer. The almost insurmountable problem presented by personally interviewing officers and having them examined physically as soon as possible after the injury persuades that, in any refinement of this research, these logistical aspects would have to be considered. These design issues are discussed in the Conclusions to the thesis.

Nevertheless, a very good response rate was obtained. Of all those

approached who were appropriate for study, only three refused to take part: one because he had taken part in the previous study and felt that he had done his 'bit'; another refused and as a reason described himself as an 'introvert'; a third agreed to take part, arrived for his interview and then said that he did not want to take part after talking it over with his wife. Achieving the sample size (n = 52) involved contacting a great many more than this number because, as in the previous study, several officers had returned to work by the time they were contacted. The plan had been to collect between 50 to 70 subjects, and an appropriate number were achieved by this extremely time consuming and labour intensive method. One of the officers injured on duty was considered an outlier and was excluded from the analysis for that reason (details of the person's situation cannot be provided as he could be easily identified).

9.5 Subjects. Data from a total sample of 52 male police officers (18 on duty injuries and 34 off duty injuries) were analysed. Most of the subjects were constables (n = 43), four were sergeants, one a detective constable, and there were three detective sergeants. This is very close to the proportion of ranks represented in the first prospective study. The mean age of the sample was 32 and they ranged in age from 22 years to 53 years. Three quarters of the sample were married (n = 39) and the remainder (n = 13) were not married or living as married (divorced, separated, or single). As in the previous prospective study, no difference was found in mean recovery rate for the married subjects, or those living as married, and others (adjusted recovery rate = .107 for married subjects and 1.12 for others).

9.6 How and where the injuries happened. The injuries were classified according to the circumstances under which they occurred (Table 9.6.1 and 9.6.2). The majority of the injuries sustained on duty were the result of an assault or chasing a suspect. The majority of those sustained off duty were in sports activities. The distinction was made that a sports injury occurring as a result of a collision with another person was classified separately from that in which there were no other players around, or was carrying out a solitary sport, for example, windsurfing or a parachute jump. Different causal attributions about the injury

might be made under these different circumstances.

Table 9.6.1

Circumstances of the injuries.

On Duty (n = 18)	**N**	**%**
assault	9	50
chase	4	22
slip/trip*	3	17
road traffic accident	2	11

* This category includes subject 27 (pushed over by police horse while at football match duty)

Off Duty (n = 34)	**N**	**%**
sports with others	13	38
slip/trip	7	21
sports alone	6	18
home	4	12
road traffic accident	4	12

The frequency of injuries by type and site are summarised in Tables 9.6.3 and 9.6.4. There was a slightly different proportion of upper to lower limb injuries in this sample compared to those in the first prospective study (Tables 7.7.2 and 7.7.3). In the present sample the upper and lower limb injuries were spread more or less evenly in on or off duty injuries. In the previous sample there were more lower limb injuries in the off duty group, and more upper limb injuries in the on duty group. Two cases were not primarily limb injuries, although they had been included because the damage to the limb was initially considered to be the primary diagnosis. One patient also had a broken clavicle, while another had also suffered a whiplash injury. The types and sites of the injuries were similar to those encountered in the first prospective study.

9.6.3

The types of on duty injuries.

Site	Fracture	Sprain	Lacer	Contus	Total
Foot	1	1	0	0	**2**
Ankle	3	2	0	0	**5**
Knee	0	1	0	0	**1**
Leg	0	0	1	0	**1**
Total Lower	**4**	**4**	**1**	**0**	**9**
Hand	3	1	1	0	**5**
Wrist	0	0	0	0	**0**
Arm	1	0	0	0	**1**
Elbow	0	0	0	2	**2**
Shoulder	0	0	0	0	**0**
Total Upper	**5**	**1**	**1**	**2**	**8**
Totals	**9**	**5**	**2**	**2**	**17***

* One subject not included in table with a whiplash injury (total n = 18)

Table 9.6.4

The types of off duty injuries

Site	Fracture	Sprain	Lacer	Abras	Contus	Total
Foot	4	0	0	0	0	**4**
Ankle	5	4	0	0	0	**9**
Knee	0	5	0	0	0	**5**
Leg	0	0	0	0	1	**1**
Total Lower	**9**	**9**	**0**	**0**	**1**	**19**
Hand	3	1	2	0	0	**6**
Wrist	2	0	0	0	0	**2**
Arm	3	0	0	0	0	**3**
Elbow	1	0	0	0	0	**1**
Shoulder	0	2	0	0	0	**2**
Total Upper	**9**	**3**	**2**	**0**	**0**	**14**
Totals	**18**	**12**	**2**	**0**	**1**	**33***

* One subject not included in table with fractured clavicle (total n = 34)

9.7 The decision to analyse the on and off duty injury groups separately. In the first prospective study it was established that factors important in determining rate of recovery from on duty injuries were different from those relevant for off duty injuries. Specifically, the time taken to return to work after an on duty injury was better explained by a group of psychosocial factors which had been selected than was length of absence after an off duty injury. The variables selected in a stepwise multiple regression analysis were culpability, depression, perceived social support at work, and the experience of a significant threatening life event in the previous 12 months.

In the first prospective study, whether the officer had been injured on or off duty was not related to the mean amount of time taken off work to recover from the injury. In contrast, some preliminary analyses of this new sample showed that those who were injured on duty remained away from work for a longer period than those who were injured off duty, as follows, length of absence 84 days (on duty) and 54 days (off duty). This difference was significant ($t = 2.81, p = .007$).

Reference to the correlation matrix of all the variables included in the present study shows the simple correlations with adjusted recovery rate and length of absence (Appendix AA). An attribution of causal responsibility showed a negative relationship ($r = .-304, p = .03$) and illness history showed a non-significant positive relationship ($r = .23, p = .10$) with adjusted recovery rate, considering the sample as a whole. In view of these very limited relationships the groups were analysed separately according to whether they had been injured on or off duty, as had been carried out to good effect in the first study.

9.8 Correlation of predictor variables with the length of absence and with adjusted recovery rate for on and off duty injury samples analysed separately. Before the regression analysis was carried out to find whether any variable was independently associated, simple correlations were calculated (see Appendices BB and CC). The significant correlations for the two

injury groups are summarised in Table 9.8.1

Table 9.8.1

Simple correlation of predictor variables with the outcome of length of absence (on duty, n = 18)

Variable	*r*	*p*
Culpability	-.54	.022
Illness history	.48	.04

Table 9.8.2

Simple correlation of predictor variables with the outcome of adjusted recovery rate (on duty, n = 18)

Variable	*r*	*p*
Culpability	-58	.01
Illness history	.56	.016
Anxiety	.43	.07 (ns trend)

In considering the above tables, adjusting the outcome for injury severity clarified the simple relationships between culpability and illness history, and the time taken to return to work. Anxiety was also positively correlated with adjusted recovery rate but this relationship was not significant. The relationship of these variables to the outcome in combination with each other needs to be tested by multivariate analysis. In view of the size of the sample of officers injured on duty, the stepwise technique was applied to take account of the number of variables compared to the sample size.

9.9 Stepwise regression analysis to test the influence of the predictor variables on an outcome of the rate of recovery in the sample of officers injured on duty. Appendix DD shows the stepwise multiple regression analysis. A good explanatory model for this group was generated which accounted for 45% of the variance in recovery time, by three variables, producing the equation, $F_{3,14} = 5.71$, $p < .05$. The order of variables selected is summarised in Table 9.9.1. The direction of the relationship with rate of recovery is shown in parentheses after the variable name.

Table 9.9.1
Summary of stepwise regression analysis (on duty injuries, n = 18).

Variable	R^2	*adjusted* R^2
Culpability (-)	.339	.297
Illness history (+)	.453	.380
Injury history (-)	.550	.454

The officer's perception of culpability in the injury incident was selected first and this variable alone accounted for 30% of the variance in recovery rate. The importance of this attribution in the on duty sample replicates the finding of the first prospective study. The officer's history of previous illness and injury absence also contributed to the explanatory power of the equation. The officer's history of absence from work due to previous injuries was not related by simple correlation to the outcome of adjusted recovery rate (see Appendix BB). Once the influence of perceived culpability, and illness history had been accounted for in the equation, the officer's history of absence due to injury showed a negative relationship with recovery rate. This would suggest that the more time taken off work because of previous injuries, the shorter would be the current absence due to injury. This

demonstrates that by sequentially including the influence of different variables, the relationship of certain variables to the outcome becomes more clear.

Those officers injured at work were separated into those who had been injured in an assault (n = 9) and those who had been injured in other ways (n = 9). The rate of recovery for the 'assault' group was longer (mean adjusted recovery rate = 1.81) than that for the 'non assault group' (mean adjusted recovery rate = 1.00). From this analysis it appears that the fact of being assaulted influences recovery rate, since those injured in other ways in this group returned to work when expected ($t = 2.27, p = .038$). Those who are assaulted would, naturally, tend to feel less culpable for the injury incident. The slower rate of recovery in officers who had been assaulted had not been found by carrying out the same analysis in the first prospective study: the mean recovery rate for those who were assaulted (n = 26) was 1.4, while that for those who were injured on duty but not assaulted (n = 17) was 1.3. This difference although in the same direction as the above finding was not significant ($t = .83$). This analysis confirmed the importance of the circumstances of the injury and where the officer places the blame for it in determining the rate of recovery.

9.10 Stepwise regression analysis to test the influence of the predictor variables on an outcome of the rate of recovery in the sample of officers injured off duty. From the data in the first prospective study, prediction of recovery after off duty injuries was thought to be more difficult. The eight predictor variables were applied to the present sample of officers injured off duty (n = 34).

By the stepwise technique, the only variable which was accepted into the equation was length of service. This was found to be positively related to recovery rate. The longer the officer had served as a police officer, the longer was the recovery time after injury (age and length of service are correlated in this sample, $r = .86, p = .0001$). The regression equation produced accounted for 15% of the variance in recovery rate ($R^2 = .147$; $F_{1,33} = 5.52$, $p < .05$), in this case the

unadjusted R^2 can be reported since only one variable is included in the equation (see Appendix S).

It was found, as in the previous off duty injury sample in the first study, that recovery rate following an off duty injury is less well predicted by the psychosocial variables thought relevant. The mean estimates of recovery time correlated highly with the actual length of absence ($r = .59, p = .0002$), which contrasts with a non-significant correlation of $r = .30$ in the on duty injury sample. The correlation between estimated absence or likely recovery time and actual recovery time was about the same for both on and off duty injury groups in the first prospective study: $r = .57, p = .0001$ (on duty) and $r = .45, p = .003$ (off duty). Recovery rate in this sample may, by these indices, have been more the consequence of actual injury severity, than in the on duty injury sample. Indeed, the mean adjusted recovery rate for the off duty injury sample is .92 implying that on average the individuals in this sample returned to work more or less when expected. This contrasts with the mean adjusted recovery rate for officers injured on duty (1.6). These issues are discussed in Chapter 10.

9.11 Discussion of applying the previous set of predictor variables to this second data set. These analyses allow the two most important conclusions from the first prospective study to obtain some confirmation. It would appear necessary, in any analysis of recovery rate following injury, to consider the experience of being injured on or off duty as phenomenologically distinct. The accident victim's attribution regarding the cause and blame for the event was also confirmed in this sample as being an important predictor of recovery rate, but only in circumstances in which culpability might be relevant, that is, in work injuries.

In this particular group of officers injured on duty, both their history of absence due to illness and due to injury contributed explanatory power to the equation. This was not found in the previous group of officers injured on duty, but was found relevant for those injured *off* duty. A high record of previous illness

absence was positively associated with rate of recovery: the more previous time off the slower the rate of recovery from the present injury. In contrast, a history of having a relatively large amount of time off work due to injuries (sustained both on and off duty) was associated with a faster recovery in this sample. One interpretation of this finding might be that which was discussed in Chapter 1, in terms of the social context of recovery. Some people under certain circumstances might feel pressure to return to work sooner. In conversation with officers, the concern was expressed that their sickness record was being monitored because of a high number of sports related injuries. In some substantiation of this, a non-significant negative correlation (r = -.16) was found in the data from the officers injured on duty between a faster return to work and a higher record of absence due to injuries. In contrast a positive, although no-significant, correlation was found between a higher history of absence due to on duty injuries and a slower recovery rate (r = .37). Although officers are encouraged to participate in sports to stay healthy, frequent sports injuries are not encouraged. It could be that the younger officers, who are more concerned about their chances of promotion, were possibly returning to work sooner for fear that their sickness absence as a consequence of being injured off duty was being monitored. This did not appear to be a concern for the older officers. Some weak substantiation for this idea was obtained.

Depression, and the experience of threatening life events in the previous year were not associated with recovery rate in this sample. They will be discussed together here and compared with the findings of the previous analyses in the first prospective study. A comparison of the two correlation matrices for the data sets (Appendices X and BB) show that the variable 'depression' is interacting quite differently with the variable representing life events in the previous year. In the first prospective study both anxiety and depression are elevated in consonance with having experienced a life event, while in the second study sample, only anxiety was elevated. In the first prospective study, having experienced a significant threatening life event in the previous year was associated with a longer absence from work. Only three individuals in the present group injured on duty had experienced a threatening life event in the previous 12 months, and this was not associated in

either direction with recovery rate. The influence of depressed affect which had produced the interesting negative relationship with recovery rate in the first sample, was not replicated. This may be explained by the influence of very important variables in this small sample. The influence of the attribution of culpability may have overshadowed the effect of other variables, including that to do with life events and affect. These points are discussed in some more detail in Chapter 10.2.

Recovery from an injury off duty was again, as in the first prospective study, found to be not associated with the psychosocial variables tested as likely predictors. In the previous study, part of the variance in recovery rate was determined by previous illness absence in that group of officers injured off duty. In this sample, in contrast, a small proportion of the variance in recovery time after an off duty injury would appear to be determined by the age or length of service.

9.12 New measures. The influence of some new variables (listed in Table 9.2.2) which were collected through semi-structured interview will now be analysed. It may seem strange to embark on new variables at the end of an empirical exercise, but this reflects an interest in finding different and more cognitive psychological influences on recovery time. The following analyses represent exploratory investigations of the influence of other variables which could lay the groundwork for future research. The separate influence of these variables, separately, on recovery rate is discussed below.

9.13 The influence of job satisfaction, work commitment and the deprivation of the latent functions of employment on rate of recovery. Job satisfaction, as measured in the previous prospective study, had failed to account for any of the variance in recovery time, which was a surprising finding. It was proposed that the method used to measure job satisfaction may have been insensitive to the particular nuances of the officer's appraisal of his job which could influence his rate of recovery. In the present study, sixteen aspects of job satisfaction were measured (Warr et al., 1979). The job satisfaction measure is a

sum of all the individual items to produce a total score, and this correlated negatively and non-significantly with adjusted recovery rate for the on duty injury sample (-.25), and positively and non-significantly in the off duty injury sample (.12). Having tested the influence of job satisfaction on rate of recovery by a second and more detailed method, and again failed to find any relationship, it was concluded that job satisfaction did not influence recovery time either independently or in the context of other variables. In the on duty sample, dissatisfaction with one aspect of the job was associated significantly with recovery rate: an expressed dissatisfaction with the way the police authority is managed correlated significantly and negatively with recovery rate (r = .-47, p = .05). In the off duty injury sample, two aspects were positively associated with recovery rate: the amount of responsibility given and the opportunity to use abilities both correlated positively with adjusted recovery rate (see Appendix AA). This might reflect the same sort of relationship between feeling more relaxed at work and a slower return, as was found in the first prospective study between social support at work and recovery rate

A measure of the construct of 'work commitment' (Jackson et al., 1983) was also applied. This produced an interesting result: in the on duty injury sample, a significant negative correlation was found (r = .-56, p = .02) but not in the off duty injury sample (r = -.06). Although the sample is small, this finding does suggest some relationship between the degree to which the officer feels his work to be a central and important part of his life and the speed with which he returns.

Perhaps the finding can be clarified by reference to the third measure to do with work: the test of deprivation of the latent functions of employment (Appendix F). This element of the interview was not introduced until after the data collection had started, with the result that there is missing data in six cases. The influence of deprivation of the latent functions of employment can only be tested in a smaller sample (n = 46) and any findings must be interpreted with caution in view of the sample size. In the on duty injury sample (n = 15), the degree to which the officer missed the enforced activity of having something to do at work was associated

negatively with rate of recovery (p = .04). There were no significant relationships of these factors with the outcome of rate of recovery for the off duty injury sample. This is an area that requires further investigation, and these latent functions could be inquired about longitudinally at various different times throughout the convalescence.

9.14 The influence of tension in the home on rate of recovery. These questions were applicable to only the subjects who were married and had families (n = 42). Intuitively, if there is tension and dissatisfaction in the home, being home all the time convalescing will probably not be conducive to good relations. The sample was not separated into on and off duty injuries for this analysis. There was some effect: the officers who rated the tension at home as '3' (n = 7) on the scale (defined as 'feels relaxed and comfortable more often than not; usual family tension, for instance, someone in the house gets on nerves about once every month, overt quarrels less than once every two weeks') returned to work more quickly than those who acknowledged less tension (*adjusted recovery rate* = .69 compared with 1.02). This difference was not significant.

Two further items concerning potential problems in the home were included. These took the form of statements ('living up to others' expectations' and 'keeping the family cheerful and contented') which the respondents were to rate according to the degree to which it was a problem. Those who found both of these to be a 'small problem' (n = 7) took relatively longer to return to work than those who did not find these a problem, although the mean differences in adjusted recovery rate were not significant.

It is not immediately clear from these analyses whether social support at home, or tension at home are relevant factors in influencing the time taken to return to work. It appears as though it would be an interesting area to analyse in much more detail. Although there were seven people in the sample who acknowledged a degree of tension, and seven who acknowledged the two items to be something of a

problem, they were not the same individuals. Indeed on this slim evidence, tension at home appears to be associated with a faster return to work, while 'not living up to others' expectations' and failing to 'keep the family cheerful' were associated with a slower return. Perhaps the interpretation is that tension would indeed drive the person back to work, while feeling inadequate around home might lead to a longer recovery in order to gain sympathy. Since the relationships are not strong there is only a limited interpretation which can be made. This also suggests that these questions are measuring two different aspects of disharmony at home, and reflects the inherent difficulty of much of the social support research, in terms of its many different facets. Generally, however, the results from attempting to find a relationship between tension at home and recovery rate were mixed and not very informative.

9.15 The influence of financial solvency on the rate of recovery. A measure used by Fryer (1986) in studies of the impact of financial change during unemployment was used to assess the influence of any financial pressure that the officer may be under. No relationship was, however, found between this measure of financial solvency and rate of return to work ($r = .098$; $p = .47$). Financial pressure was not a significant determinant of recovery rate.

9.16 The influence of the ability to manage time on rate of recovery. Of the five factors in Bolton's measure of Time Management (Bolton, 1984), one in particular was relevant for both on and off duty samples. The scores on the scale measuring 'ease with time' showed a negative trend with recovery rate. Although not statistically significant, the direction of this trend would suggest that those officers who returned to work more quickly were those who could not fill their time, were concerned about their future, and were most uncomfortable about the convalescence. This relates to the above finding regarding the dependence on the enforced activity of work, and suggests that individual differences in the dependence upon work for structure and feelings of worth might aid an understanding of variation in recovery time. In addition, these measures were taken during *early* convalescence and may not reflect the true influence of this construct.

There is every likelihood that with the passage of time during a lengthy convalescence there would be a progressive running out of things to do and a decreasing sense of a structure to the day. In an analysis of the intercorrelations of these variables in the whole sample considered together, missing the enforced activity of work was associated with a faster return, while more confidence in the 'predictability of the future' was associated with a faster return. These variables require further testing as it relates to deprivation of the latent functions of employment.

9.17 The influence of having been exposed at Lockerbie on rate of recovery. It had been anticipated that exposure at Lockerbie would be associated with a slower return to work after injury. For this analysis the whole group was again considered together (on and off duty injury groups combined). Chapter 8 describes a within subjects comparison of officers before and after they had attended Lockerbie. It was found that in a sample of officers who had worked in the mortuary significantly more time was taken off work on sick leave compared with their own record for the year before. It is notable that the effect was greatest for both the number of periods of short term uncertificated absence, and the total amount of time taken for such absences.

This previous finding might lead to the expectation that the officers who were exposed to body handling (n = 20) would have a slower adjusted recovery rate than other officers who were not exposed (n = 32). No such effect was found. The officers in this group who had been exposed returned to work at more or less the same rate as those who had not been exposed (adjusted recovery rate = 1.03 compared with 1.12 for the non-exposed group) although the difference was not significant ($t = .458$).

Age and length of service were, however, confounded with the likelihood of having been exposed to traumatic duties at the disaster site. The exposed group had been serving as police officers for a mean of 7.5 years, while those who were not exposed had been serving for a mean of 11 years. The younger officers were

assigned to the more demanding duties, but younger officers also returned to work more quickly in this second study sample.

A further explanation is as follows: the previous finding in the Lockerbie research had pertained primarily to an increase in short term sickness absence, rather than absence due to injuries in the year following duty at Lockerbie (although a large, possibly spurious, difference in absence due to injury between the two years, 1988 and 1989 was found). The increase in time taken off work on short term absence was interpreted as the officers requiring a release from possible acute stress occasioned by their recollections of the experience (Mitchell and McLay, 1990). The present injury sample were, of course, off work due to their injury during that same time period. In this sample any need for such a release would have been served by their having to be absent because of their injury. Any desire on the part of the officer for a short break, which would have been reflected in an increase in observed time off would have been masked by their absence due to the injury. While a short break could possibly relieve distress a lengthy break would possibly exacerbate intrusive ideation and other symptoms, and encourage a quicker return to work. About one third of the officers interviewed for the injury study acknowledged that being off work had allowed time to think (sometimes intrusively) about their experiences at Lockerbie a great deal more and this had been very unpleasant and worrying. Also, these results are not easily compared with those in the Lockerbie study. To compare this finding with that reported in Section 8.9, is to compare findings from two different research designs. The study of the longer term health effects after Lockerbie was a within groups comparison, while the present small comparison of exposed and non-exposed officers is a between groups comparison.

9.18 Use of a semi structured interview in place of a questionnaire: the Hawthorne effect. The plan in using a semi-structured interview in the second prospective study was to measure variables which had been found influential in the first prospective study with greater precision. This was successful

in the measurement of job satisfaction, and greater confidence could be placed on these results obtained by this method. Overall, however, in considering the variables which were influential in the first study, one of the more important was the officer's history of ill health absence. This variable was not collected either by self report paper and pencil techniques nor by interview, but from the officer's health record. The measure of culpability was collected by self report. The usual advantage of semi-structured interview also may not have been as great in this population. There is a high level of literacy, and the officers are accustomed to writing reports and completing forms. The potential for improvement in the measurement of variables may not have been there in the same way as is found advantageous in a community sample.

The use of the interview also restricted the possible sample size. Given the financial resources available and the time constraints, interviewing and examining 52 cases involved a great deal of work and organisation. In most cases convalescence is relatively short, and some officers returned to work within a month. This required that every aspect of the assessment be carried out in a compressed time frame. The quantity of contact and assessment during such a short period of time for those officers may have had an influence on the natural course of the convalescence. One might expect that had the concentration of the research had been on convalescence itself, this research method would be inappropriate. An aspect of the phenomenon under investigation, the effect of isolation and lack of attention during convalescence, would be affected. In comparison with the relative social isolation of convalescence, the subjects in this study received a great deal of attention. They were telephoned by the author, and an appointment arranged to meet the officer at his home or at Headquarters for an interview, in addition to which the nursing sister contacted the officer for interview and examination. There was, thus, an unusual focus on their absence from work and the reasons for it, and this may have had an influence.

9.19 Conclusions. How do these findings relate to the Hypotheses? Hypothesis 1 was confirmed in this second prospective study. It was the case that

some of the same factors which were relevant in determining rate of recovery after an on duty injury in the first sample were also important in the second. It was also the case that psychological factors, for example the attributions which the person makes about the accident, can determine rate of recovery. This is only relevant in on duty injuries in which culpability is apparently an issue. This confirmed Hypothesis 2.

Hypothesis 3 was not confirmed: job satisfaction, even according to this more detailed measure, was not related to the rate of recovery after injury.

Hypothesis 4 was not confirmed. There was very limited variation in the responses to the questions about tension at home, most officers rating their home life as being quite satisfactory. Hypothesis 5 obtained no confirmation. Hypothesis 6 was confirmed, that time management did influence the time taken to return to work after injury but only according to one of the five factors in Bolton's Time Management Questionnaire. Those who felt able to fill their time more productively were also those who returned to work more slowly, although the relationship is not significant. An apparent need for this structure was related in the whole sample (officers injured both on and off duty) to a shorter recovery rate.

In any study which considers a complicated phenomenon like recovery time, there are obviously many individual factors or even some general themes (possibly iatrogenic) which have not been included as measures. In addition, the logistics involved in carrying out two prospective studies necessitated that they overlapped. The result was that certain factors, such as social support at work, which turned out to be important only became obviously so after detailed analysis of the results from the first study was complete. Nevertheless, some findings from the first prospective study were replicated in this second prospective study, which suggests general themes reflecting social and psychological influences on recovery.

Chapter 10. The Conclusion to the Thesis

Abstract. This chapter reviews the main findings of the thesis and places them in the context of previous research. The research conducted in this thesis provide little evidence for a vulnerability model in response to injury, since few characteristics of the officer (for example, affective state or level of job satisfaction) were found to be strongly associated with the outcome of recovery rate. In contrast, the data suggest a socio-cognitive approach to understanding normal recovery from minor to moderate injuries. The officer's causal explanation of the incident in which he was injured was found to be and important predictor of rate of recovery.

10.1 An overview of the aims of the thesis and a summary of the main findings. Psychological research can aim to test and to impose a theoretical framework on 'working models' of complex aspects of human behaviour. As has been described in Chapter 1, these working models are sometimes perspectives derived from common sense. The impetus for the present thesis was derived from a clinical working model that patients who are delayed in recovering from a physical injury, are so because of their own disposition and volition. The process of recovery is complex from both the physical and the psychological aspects to rehabilitation. The findings in this thesis make a contribution to understanding this process in a discrete occupational group

The aim of the research was to find whether rate of recovery from an injury can be predicted from social and psychological characteristics of the patient. It is argued that the psychiatric term 'malingering' is corrupted and generalised to include a constellation of social and psychological attributes of the patient considered to influence rate of recovery. Very little research exists to guide the selection of variables or what model of recovery should be tested. One previous study found causal attributions to be important in determining recovery time (Brewin et al., 1983), so this variable was included. Other variables were derived from previous research on the unemployed (Warr and Jackson, 1985; Fryer,1988;

Bolton and Oatley, 1985). Additional variables which were tested were those factors which one might reasonably expect to have an influence. The selection of these particular variables, including depression, job dissatisfaction, and feeling anxious is substantiated by doctors' perceptions of possible influences (Chapter 1.3).

In addition to the search for predictors of recovery rate, a cross sectional study was included in this thesis which looked specifically at convalescence. Far from being a relaxing and enjoyable time, there is evidence that patients have to struggle to keep their spirits up while not working. This finding is entirely interpretable by reference to studies of the affective response to unemployment (Fryer, 1988).

The research was not driven by a strict theoretical model, but the idea behind was that some patients may be more prone to an unusually long recovery period as a consequence of a variety of personal characteristics, which can be measured. As such it is a form of vulnerability model. To allow this to be tested correctly, the measures of these relevant characteristics should be taken just before the person is injured, which is impossible in practice. The compromise in the present research is that measures of the relevant variables were obtained early in the convalescence. The assumption was made that apart from the severity of the injury which is clearly the most important influence, several other variables will make some contribution towards accounting for variation in rate of recovery. Regression analysis is able to clarify the influence of several different variables in combination, assessing their relative importance. These are summarised in Table 10.1.1.

Table 10.1.1

Summary of significant predictors of rate of recovery selected by stepwise regression analyses with cumulative adjusted R^2 and order of selection in brackets

	On Duty		Off Duty	
	First	**Second**	**First**	**Second**
	(n=43)	*(n=18)*	*(n=39)*	*(n=34)*
Culpability	.057 (1)	.297 (1)		
Illness history		.380 (2)	.297	
Injury history		.454 (3)		
Depression	.102 (2)			
Life Events	.183 (3)			
Work Social Support	.269 (4)			
Service				.121
Total variance	.269	.454	.297	.121

Themes emerged from these analyses which are summarised below (Table 10.1.2). The predictor variables are separated as factors which are assumed to have existed before the injury happened (pre-injury factors), post-injury factors, and the affective state of the officer during early convalescence. It is not clear whether affective state is a pre- or a post-injury factor. Any psychological distress detected may be a result of having been injured, the person's usual state, or the result of some other significant event or chronic difficulty.

Although the factors are discussed separately in this review, the statement *given the influence of the other variables in the equation* is always assumed. In summary, there was evidence that certain patient characteristics were related to the chances of people returning to work more quickly or more slowly than expected.

Table 10.1.2

Summary of the main finding.

Recovery from an injury at work is related to different social and psychological factors than recovery from an injury which happens while not at work. The observed difference is the consequence of the differing attributions about who is to blame in the incident in which they were injured. Officers injured off duty attributed the blame for the incident to themselves more readily than did officers injured on duty.

Summary of predictor variables associated with rate of recovery.

Pre-injury factors

Life events in the previous 12 months, perceived degree of social support at work, previous absence from work due to illness and injury, and length of service in the police were all included in this category. For those injured on duty having experienced a life event with significant long term threat was associated with a slower recovery rate as, rather counterintuitively, was a perception of the work place as being socially supportive. A history of previous absence from work due to illness was associated with slower recovery: in the off duty group in the first study and in the on duty group in the second study. In contrast, having a relatively low previous absence due to injuries was associated with a longer recovery in officers injured on duty (second sample).

Post-injury factors

A perception by the officer of not being to blame for an injury happening on duty was associated with a slower rate of recovery in both the first and the second samples. An apparent dependence upon the enforced activity which work requires and an inability to manage time usefully during early convalescence without the structure of work was associated with a faster return to work.

Affective state

In the first study, officers injured on duty who reported feeling depressed returned to work more quickly.

10.2 What model of recovery in this population is suggested by the data? The strongest theme which emerged from this research was the most interesting from a cognitive perspective. It was that the accident victim's appraisal of the situation in which he was injured is an important determinant of the time taken to recover. This finding replicated and extended that of Brewin et al. (1983). Little evidence was obtained that other psychological factors are important predictors of rate of recovery. In particular, it was a surprise that job dissatisfaction is not related to length of recovery. Although not found to be statistically significant, there are indications that feeling anxious during the early part of the convalescence is associated with a longer recovery, while feeling depressed might hasten the return to work. The experience of threatening life events in the previous year was also weakly related to recovery rate. An association was also found between previous illness absence and the rate of recovery. The patient's response to an injury, in reality, also includes his response to the convalescence. The cross sectional study showed that convalescence can be a distressing experience. The exploratory variables tested in the second prospective study also suggested that, in some cases, a sense of being deprived of the structure of work can motivate a faster return to work. In summary, although a perception of blameworthiness for the accident and previous illness absence were related to length of recovery, there was little further evidence that the officers were motivated to remain off work unnecessarily, convalescing from injury. People do take different lengths of time to recover from similarly severe injuries, but so too is there variation in doctors' estimates of how long is an appropriate period of recovery for particular injuries. The data points away from a vulnerability model and towards a socio-cognitive model which would include the patient's appraisal of the event of being injured and the experience of convalescence.

10.3 The Attribution of blame. Brewin et al. (1983) demonstrated that attributions of blame for an injury incident are important in determining rate of recovery: specifically, those who blame themselves return to work more quickly. The association between attributing the blame for an injury to oneself and returning to work more quickly was replicated by the present findings, although it was

extended.

The present research was able to establish a causal link between the attribution measured a mean of twelve days after the injury and how long the injured person takes to recover. In contrast, Brewin et al. (1983) were only able to establish a link between attributions made *after* the patient had returned to work and length of recovery. Brewin et al. (ibid.) had interpreted the lack of a relationship between earlier attributions and the outcome to the fact that the attributions about an event may not be stable so soon after its occurrence.

In obtaining causal attributions after the return to work, there exists the possibility of confounding an attribution about the *event* itself and an attribution about its *sequelae*. Even though the subjects would be asked who or what they saw as being to blame for the accident, this perception, if taken after the return to work, must necessarily be coloured by the consequences of the injury. Those who had returned to work quickly had recovered, were back at work and everything was back to normal. The recovery can be assumed to have been uneventful as evidenced by how quickly they returned to work. All this might lead the person to dismiss the accident as 'just' carelessness or stupidity on their part, that is, attribute the blame for the incident to themselves. In contrast, those whose recovery was delayed were well aware, by the time they returned to work, of the trouble and disruption that the injury had caused them. Peterson et al. (1982) had found that good events tend to be explained more by internal factors than do bad events. While an injury could never really be considered a good event, the fact that it did not result in serious injury, and an excessive loss of time from work could, in the grand scheme of possible consequences, be considered relatively good. Bulman and Wortman (1977) found that the amount of elapsed time since an accident influenced where an accident victim lay the blame for the incident. Specifically, the more time that had passed the greater the likelihood that the blame for it would be placed externally, suggesting that the attribution was made contextually in terms of the sequelae of the accident.

This idea that the consequences of an accident influence the causal attributions that are made about its occurrence was tested experimentally by Mitchell and Cecchi (1991). Subjects were presented with simple descriptions of two accidents and were asked to 'vividly' imagine themselves as the victims of these accidents. In one case the accident resulted in bruising, and in the other several bones were broken. The scenarios were identical apart from the resultant injury. As predicted, subjects more frequently provided external causal explanations in the case of the more serious injury, for example, 'the dog came rushing in and knocked me off the ladder'; while providing internal causal explanations for minor injury, for example, 'I didn't make sure the ladder was steady'. These differences were significant (p = .0025, for attributions of cause and p = .01 for attributions of blame). These findings confirm that there may be a confounding of attributions about the event, and attributions about the consequences of the event. This could imply that the subjects in Brewin's study (ibid.) are responding to what they then knew about the consequences of the accident. The present research avoided that possible confounding and was able to establish the direction of causality between the attribution and the behavioural outcome: the timing of the return to work.

When the research was originally conceived, a psychological distinction between on and off duty injuries in these officers was not an important focus of interest. This issue did, however, turn out to be one of the most important findings. While the prediction of some of the variance in recovery after an on duty incident is attributable to psychological factors (the attribution of culpability, the experience of life events, and depression), the variance in recovery time after off duty injuries was not. Causal perceptions of the incident were only relevant in on duty incidents. Given the socio-legal context within which police officers work it should not be surprising that issues to do with fault and blame should be important. No previous research has looked at the influence of such attributions in recovery from minor or moderate injury in non-work circumstances, but it may be that culpability is a concept which is simply not relevant outside an occupational context. This needs further explanation.

Officers injured off duty generated causal explanations, but these did not influence the time taken to return to work. Overall, attributions of blame tended to be external for injuries which occurred at work, while they tended to be internal for injuries which occurred off duty. There were, of course, some incidents off duty for which the officer felt no self blame. A group of officers (n = 11) who had the lowest culpability scores comprised 6 officers injured on duty and 5 officers injured off duty. The expectation would be that a sense of not being to blame for the incident would lead to a slower return to work, according to the hypothesis of Brewin et al. (1983). This was the case for the group of officers injured on duty, who took two and half times longer than expected to return to work (adjusted recovery rate = 2.4). It was not the case for the officers injured off duty who, on average, returned more or less when expected (adjusted recovery rate = .97). This difference was significant ($t = 2.74$, $p = .023$). Causal attributions were not relevant to rate of recovery after an off duty injury. This suggests that the process of recovery from an industrial injury may be quite different than any other type of injury circumstance and that to generalise the findings about one to the other is not appropriate.

Although there was a strong association between the tendency to attribute blame externally with having been injured at work (see Chapters 7 and 9), within this group there are differences. It would appear that although the attribution is important in determining the outcome of recovery rate, the precise circumstances of the injury are also important. This is most apparent in the case of assaults: comparing all incidents at work, those in which the officers attributed most blame to external sources were assaults ($t = 1.9$, $p = .03$). This was also associated with a significantly longer recovery rate (in the second study), compared with officers who had been injured at work but not assaulted ($t = 2.27$, $p = .04$). In terms of the appraisal of the incident, being assaulted requires closer scrutiny.

One of the most prevalent reasons proposed for delayed recovery is that the accident victim is seeking compensation. The fact that assaults, culpability, and a

protracted absence are all associated leads one to question whether the influence of compensation is a motivator for protracted absence. Being injured in an assault renders the victim eligible to apply for criminal injuries compensation (Chapter 3.8), and since this group are also those who are off work the longest, is their length of recovery influenced by the possibility of compensation? Compensation is paid on the basis of their having sustained a permanent impairment or disfigurement, or having lost excessive amounts of wages and benefits. Being off work for a long time, in itself, does not necessarily result in a compensation award. Applying for criminal injuries compensation is a matter of course, and the Police Federation routinely complete the necessary forms and assist the officers. From interviews with officers the attitude is one of, 'well if it's there and I am eligible then why not apply?'. It does not appear from this casual attitude that the officer is going to alter his or her behaviour and stay off work for an unreasonable length of time in order to secure a claim. The system is, in any event, geared towards delayed gratification: most claims are not processed until more than two years after the initial application (*CICB training seminar*). Explaining delayed lengthy recovery in these simple terms may miss the mark of the complexity of the officer's appraisal of having been assaulted.

Police officers perceive their radio and uniform as providing protection from an aggressor since each of these signifies that each officer is working as part of a team. That perception is altered when, for instance, back up fails to arrive or they are assaulted. This may result in the destruction of some basic assumptions they have about the job. Janoff-Bulman (1988), in the context of post-traumatic stress reactions has termed this a 'shattering of basic assumptions' about the world, that it is benign and safe, leading to feelings of vulnerability. There is no reason to expect that police officers would be immune to feeling vulnerable: two officers included in the research who had been assaulted subsequently left the force, one during the convalescence and the other shortly after his return. These departures were not the consequence of physical sequelae of the injury sustained, but rather their changed perceptions about the job, and whether they wanted to continue in it. With

appropriate intervention, the officers' confidence could have been reinstated avoiding the loss of this resource.

That there is something different about an assault is also evident from the following. In some circumstances, if an officer is injured while chasing a suspect, he or she can apply for compensation. Officers who had been assaulted and were claiming compensation were compared with officers who had been injured in a chase and were also claiming. Despite the fact that both were claiming compensation, those who had been assaulted took relatively longer to return to work compared with those injured in a chase (adjusted recovery rate = 1.7 for assault victims compared with 1.3). This suggests that applying for compensation alone is not the most important motivator, but that having been assaulted is. There was a greater likelihood that officers injured in an assault would feel anger compared with others injured in other ways (X^2 = 17.02, p = .0002). Feeling anger (and withdrawal from contacts) is associated with some post traumatic symptoms, but the claiming of compensation may be a way of the officer redressing the imbalance he may see.

10.4 Illness absence. The officer's history of the amount of time taken off previously for various reasons of ill health and injury was found to be associated with recovery rate. A history of being absent from work through ill health was not specifically proposed in other research as being a strong predictor, that it should be makes intuitive sense. There are medical, social and psychological interpretations that can be made of this relationship. Illness history in the first sample of officers injured off duty was the only factor which was strongly associated with adjusted recovery rate (r = .545, p = .0003), accounting for 30% (R^2 = .297) of the variance in recovery time.

There are several interpretations of this finding, some of which have been discussed in Chapter 7.15 and Chapter 9.11. Lengthy absence could be just a typical piece of behaviour on the part of the officer. He or she would customarily take a long time to return to work given the opportunity to be off work. In this case

all the officer would need is a cooperative medical practitioner to provide the necessary sick lines based on his or her patient's self report of symptoms. There are probably differences between patients in terms of their confidence to ask for a further sick line.

On the other hand, the medical practitioner may be simply very indecisive in providing sick lines and may not be able or willing to initiate the return to work. The patient on the other hand is waiting for instructions from the doctor to return. By this arrangement the absence could be almost infinite. Not every doctor approaches his or her practice in the same way, and there must be individual differences among them in the degree to which they are interested in managing a case, and in terminating the convalescence. They would also have varying knowledge of the physical requirements of their patient's job, and perhaps have a misperception of how arduous and demanding it is. Silence on the part of the doctor could have the effect of confirming in the patient's mind that there is something seriously wrong. The dyad could easily set up in which both the doctor and the patient are waiting for the other to make a decision. The issue of iatrogenic influences on convalescence was not addressed in the present research, but may well be an important source of variation.

To look at the present finding: illness history was found to be a significant influence on recovery time in both on and off duty samples. In generating the variable for illness history, both short term absence (7 days and less) and longer term absence (8 days and over) were summed. The measure of longer term absence was most strongly associated with recovery rate (p = .0005 in the first study off duty injuries, and p = .023 in the second study on duty injuries). The quantum of short term absence was also associated, but not to statistical significance (p = .11 in the first study off duty injuries, and p = .20 in the second study on duty injuries). This may suggest that people with a high level of previous long term illness absence are less healthy generally, than would be the interpretation if only short term absence was strongly associated with recovery rate. This factor does not

vary systematically with whether the injury happened at work or not, so previous illness absence could operate as a general vulnerability factor in predicting length of absence for each spell.

In the present research, there is an indication that previous absence due to injuries bears a negative relationship with current absence. A high level of previous absence due to injuries may be conducive to returning to work more quickly: this was the case in the group of officers injured off duty (second sample). From the author's interviews with officers it was found that those who had been off work frequently in the past, due to injuries sustained in sports, were often concerned about their sickness record. The officer's recovery rate may be influenced by warnings from a supervisor or a concern on his or her own part that a return to work should be effected as quickly as possible. Under certain circumstances, and in combination with other factors, such as age and interest in returning to a sporting activity, previous absence due to injury may predict current absence.

The precise reasons why previous and current absence are correlated is not clear from the current data but different interpretations have been discussed above. In generating a screening instrument which would assist the identification of vulnerable employees the quantum of previous illness absence should be considered.

10.5 Common expectations: did psychological state and job dissatisfaction influence recovery? Two variables which are widely assumed to exert a strong influence on rate of recovery were found to be either unrelated, or weakly related: job dissatisfaction and affective state. To deal, first, with the findings which were obtained regarding affective state.

Patients who are depressed or anxious are seen by clinicians as being prone to lengthy recovery, and some evidence was obtained for an influence. The findings of the cross sectional study, and the background literature attest to a relationship between convalescence and affective state (Romano and Turner, 1985;

Chapter 5 this thesis). In the clinical setting this association might be interpreted as a causal relationship. The findings from the present research provide some indication that the more anxious the person is the longer the recovery. Anxiety correlated positively with adjusted recovery rate ($r = .435$, $p = .07$; on duty injuries, second sample) but this factor was not accepted by the stepwise regression analysis. Elevated anxiety may be reflective of the sometimes conflicting pressures of home and work (as the association of anxiety with the experience of a life event suggests: $r = .356$, $p = .03$, in the first sample and $r = .474$, $p = .05$, in the second), in this case a quicker return to work might only hasten the re-commencement of the conflicts. This effect was found only in the sample of officers injured on duty. Considering the sort of problems presented by officers for counselling at the Medical Department, those who are off for long periods of time more often display anxiety disorders.

In contrast, the more depressed the person the shorter the recovery ($r = -.263$, $p = .09$, in on duty injuries, first sample). This variable was accepted by the stepwise regression analysis. The interesting negative relationship between depression and the time taken to return to work suggests that depressed affect at the *beginning* of a convalescence may have a quite different effect to that expected. It may act to encourage an earlier return to work since the officer may anticipate the potentially depressive effects of convalescence. In this sense the earlier return to work operates as a self protective mental health strategy. This finding was not replicated in the second prospective study.

The interesting question posed in the cross sectional study was whether there was a change in affective state during convalescence as was apparently the case from the findings reported in Chapter 5. The difficulties of actually coming to grips with this longitudinal analysis are discussed in Chapter 1.6. Nevertheless, the precise question of the interaction between affective state and length of absence still needs to be addressed. On the evidence available, it would appear that depression and anxiety at the outset may have some relationship to length of

absence. In the context of other factors such as attributions of culpability and injury severity, they do not exert a strong influence. Within the constraints of the cross sectional design, the data suggest that the experience of convalescence is psychologically distressing to people who may not have been distressed at the beginning of the convalescence.

An association was also found between experiencing a significant life event and the rate of recovery. This factor was only relevant for officers injured on duty (first sample) and was not a large contributor to the equation, given the influence of the other variables. This finding was not replicated in the second study, although it is not known whether this was the consequence of the relatively low incidence of significant life events in this sample (n = 3). Experiencing a significant life event constitutes a vulnerability factor for subsequent psychological ill health (Fisher and Reason, 1988; Brown and Harris, 1978). A discussion of the influence of this factor appears in Chapter 7.17 and Chapter 9.11. It may be that having experienced a significant life event interacts differentially with other variables included in the equation and that under certain circumstances and configurations, having experienced a significant life event is conducive to a slower rate of recovery. The relatively low incidence of threatening life events in the second prospective study may have obscured a general theme.

These variables had originally been conceptualised as vulnerability factors, that is as pre-existing patient characteristics which might render the individual more vulnerable for a poor response to injury. This may be incorrect. Closer scrutiny is required of the possible sources of psychological symptoms, the response to previous life events and how these interact with the possibility of being off work. As is the case in any study of affective state, the causal issues need to be distinguished. The affective response by the patient's appraisal of the sudden change in his or her circumstances occasioned by the injury may be more relevant.

Job dissatisfaction was found to be unrelated to rate of recovery, although

this factor was measured in two different ways in order to try and more accurately measure any influence. Both Allodi and Montgomery (1979) and Brewin et al. (1983) found that job dissatisfaction was associated with a longer than expected recovery rate, although in both studies the influence was relatively weak. In the study by Allodi and Montgomery, job dissatisfaction correlated positively with recovery rate (r = .15, p = .05) when measured at the beginning of the convalescence, but not when measured in follow up (3 months later). In the study by Brewin et al. (ibid.) this variable was the least significant factor, correlating r = .21 (p = .05) with adjusted recovery rate when measured soon after the injury, although no later measure was taken.

The lack of a relationship between job dissatisfaction and recovery rate that was found in the present research is surprising and requires explanation. It may be the consequence of the nature of the sample studied. In the above cited studies, the subjects were manual workers carrying out different types of jobs. In contrast, the subjects studied in this thesis are all police officers carrying out, by and large, the same job for the same employer. In studying this homogeneous group of police officers, their satisfaction with the job may not be so varied as would be the job satisfaction or dissatisfaction expressed by people who work at all different jobs for all different employers. A wide range in perceived job satisfaction would be expected in a general population sample, but possibly less so in a single occupational group. In addition, police work is a vocation or a career rather than a 'just' a job, and recruits join the police intending to make it a life long profession. Police officers are highly trained, and many have University degrees and other qualifications. Certainly the working context, as well as some of the motivations for doing this particular type of work, are quite different than those of a manual labourer or factory worker. In a restricted working group like this, 'job satisfaction' may be too simplistic a construct to have a large influence and certainly in this sample did not emerge as a general theme associated with variation in rate of recovery. In addition, the expectation that job dissatisfaction is a strong influence on absence is based on the assumption that avoidance is the most common type of

coping strategy to deal with chronic problems at work. Although this extrapolates from a quite different context, in coping with their duties at the Lockerbie disaster, officers reported that 'getting on with the job', that is, a problem solving strategy, was the most common coping response (used by 52% of the officers surveyed). In contrast, only 6% used avoidance strategies, like withdrawal or denial (Paton and Mitchell, 1990).

There may be subtleties of job satisfaction which warrant further research. Indeed, in the group of officers injured on duty (first sample) a significant relationship was found between high levels of perceived social support at work from the supervisor and colleagues and the likelihood of staying off work longer. This was interpreted to mean that insecure officers might worry about what the people at work are thinking of them being off, and return to work quickly in an attempt to re-establish a position which may seem uncertain to them. In considering the more detailed aspects of job satisfaction measured in the second prospective study, some weak associations between these aspects and rate of recovery might support this interpretation. Not getting recognition for good work, no attention being paid to suggestions that the officer makes, and a poor rating of relations between management and lower ranks, are all indicative of feelings of not being appreciated and possibly also of insecurity. An officer who feels secure and supported may not have those concerns.

A trend was observed that a *positive* rating by the officer of some aspects of work was associated with a relatively slower return expressed satisfaction about job security, being given adequate levels of responsibility, and being allowed to use one's abilities, were all associated with a slower return. Those officers who feel stable and secure in their jobs are those who can relax sufficiently to recover before returning to work, while officers who are nervous about their jobs return to work sooner. If job insecurity is motivating a relatively faster return to work then it would hardly be conducive to a good and positive rehabilitation.

The relationship between job dissatisfaction and rate of recovery requires further testing, although the findings from the present study could be generalised to other professional groups and, in particular, to other emergency services. There exists no other study of recovery rate in a single occupational group of this sort , nor in a group of professionals, and so parallels cannot be drawn between the present finding and others. Police officers are distinct from labourers and intransigent workers, but not from other groups with life long careers. In any occupational group, in managing human resources the employer would be less interested in the influence of factors in a general working population than he or she would be in the influence in a single occupational group, and so the influence of factors in a more homogeneous population is important.

10.6 The influence of age, gender and marital status on rate of recovery. In this sample, as expected, overall these demographic factors did not prove to be significant determinants of time off after injury. Age had been found in the studies by Galasko et al. (1986) and MacKenzie (1986) to be an important factor in determining the likelihood of subsequent disability after injury. That age is not a significant overall predictor of rate of recovery, in the present research is likely the result of the restricted age range in the sample. It may also be explained by the interaction between age and type of job. The older officers may well have jobs which are physically less demanding. In the present thesis age and length of service have been used almost interchangeably (they are highly correlated, r = .89). There is a discernible difference, however, in that length of service is more important in terms of the officer's knowledge of policing and work practices. In the second study length of service was found to be the only significant predictor of recovery time after an off duty injury, accounting for just over ten per cent of the variance in rate of recovery.

There were only four females in the study. Some preliminary analysis of the influence of gender on rate of recovery showed that it was not a significant influence, so gender was not included. If the research were being repeated in

another place of employment, this factor would have to be considered in the analysis. Marital status was also not found to be an influence. Brewin et al. (1983) had found that married subjects tended to return to work more quickly. Marital status, in their analysis, had made a significant contribution to explaining recovery rate. Although it was not a significant difference in the sample of police officers, there was a tendency for the relatively few unmarried officers to return to work more quickly. Single officers only receive the minimum rent allowance from the police authority and the cheapest place for them to live is at home with their parents, as most unmarried officers do. It could be that a mother may be more likely to push her son or daughter back to work, than would a wife or husband who may not see enough of their spouse because of the shift system. This was not empirically tested, but it is a possibility. In addition, there is no information from the report of the research by Brewin et al. (ibid.) as to how many unmarried subjects were in their sample. In their small sample size (n = 33), one or two outliers could have skewed the finding. While the unmarried police officers represent a fairly homogeneous group of young men living with their parents, the unmarried group included in the hospital sample may been quite heterogeneous. These possible difference in sample could explain why there was no observed effect from marital status in the present research.

While there may be some characteristics of this population of police officers which would set them apart from the general population this does not pose problems from the perspective of occupational psychology. The present findings demonstrate that in a restricted single occupational group, the importance of these factors is diminished, allowing more subtle influences to be observed.

10.7 The rare instance. In the reality of clinical practice there may be individual patients whose prognosis remains an enigma to the treating physician. The problem which was posed at the outset to this thesis was that it is these individual cases (whether real or mythical) which influence the general perception of the process of recovery. Were there any such patients in the present study? From the combined sample from both the first and second studies (n = 134) all

officers deemed by the method adopted in this thesis to be taking far less or far more time to recover were obtained. Ten officers returned to work in half the expected time or shorter ('accelerated'), and twenty one took twice the expected time or longer ('delayed'). The difference between the mean estimated absence and the actual absence for these sub-groups is quite startling. The officers who were accelerated in their return to work were estimated to require nine weeks off work, and returned in four; those who were delayed were estimated to require five weeks, and took 14 weeks. Those officers whose adjusted recovery rate was .50 were allocated to the first group and those whose adjusted recovery rate was 2.0 and above to the second (Table 10.7.1).

Table 10.7.1

The incidence of officers who were accelerated or delayed in their recovery (figures in brackets represent the percentage of the *total* sample of officers injured on duty, n = 61 or off duty, n = 73).

	accelerated	**delayed**	
on duty	1 (2%)	9 (16%)	10
off duty	11 (15%)	10 (14%)	21
total	**12**	**19**	**31**

These two extremes were compared to find if certain of the psychological variables which were measured were associated with taking half as long or twice as long as expected. There was obviously an imbalanced representation from the two groups: one person in the on duty sample was accelerated, while 16% of this sample were delayed (n = 9). Fifteen per cent of the off duty sample (n = 11) took half the expected time, while 14% took twice as long or more. What this means is that while the incidence of taking twice as long to recover is more or less the same for on and off duty injuries, there are proportionately more in the off duty sample who return to work quickly. That is to say the likelihood of a person returning to work much earlier than expected after an on duty injury is less than that likelihood for people injured off duty.

Explaining why these people were extreme should have been possible by reference to the likely predictor variables. There were no strong relationships, by carrying out a comparison of means test, between these categories and the predictor variables. However, there were some differences. In the whole sample there were 14 'cases' of anxiety (given the criteria of Zigmond and Snaith, 1983) and three of these belonged in the 'delayed' category. In the whole sample there were 5 'cases' of depression, and two of these are in the 'accelerated' category. There were a total of 26 officers who had experienced threatening life events in the whole sample: six

of these life events were 'delayed' while one with a threatening life event was 'accelerated'. So there was some indication that affective state and the experience of life events may be associated with differing rates of return to work. The mean difference between the two groups, in terms of job satisfaction, could not be calculated because different instruments were used in the two studies.

There is an implicit value judgement as regards the speed of return to work, and in the study by Brewin et al. (1983) rate of return to work was used as an *explicit* measure of coping. This perception of the timing of return to work is a reflection of considering only one aspect of the process and, according to the 'accident neurosis' thesis (Miller, 1961), a faster return is evidence that the person has coped well with the injury and is not fearful of returning to the workplace. There could, however, be many other factors, or more likely a mixture of many factors, which influence the timing of return to work (some of which have been identified in this thesis) other than the presence or absence of a form of post traumatic reaction to the accident. Examples might be job insecurity, as described above (Section 10.5). A person returning to work sooner than expected is not considered to be behaving in any way out of the ordinary: foreshortened recovery time is considered good coping while protracted recovery is not. Using work as a refuge from other difficulties that may be operative in the person's life does not necessarily lead to a positive recovery (Chapter 7.17). A weak, but interesting relationship was found between elevated depression and anxiety at the beginning of the convalescence and missing the structure of work, and an inability to use time productively. This might provide some support for the idea that not all accelerated return to work is positive. This whole discussion begs the question of an optimum recovery time. Given, however, the problems that can develop during protracted convalescence it is probably preferable to have employees return to work after injury sooner rather than later.

10.8 The outcome measure: adjusted recovery rate. The problem of obtaining a yardstick whereby the injuries could be compared for severity has been discussed in Chapter 6. It is important to return to this problem. That there are no

known 'average' lengths of recovery for particular injuries and that no two injuries are identical does not render the task of comparison easier. Nevertheless, an underlying assumption of the research was that people would take different lengths of time to recover from similar injuries, and that the injuries could be calibrated in some way. In considering the sample as a whole (n = 134, both samples combined) the mean adjusted recovery rate suggests that, on average, officers were taking one third longer than expected to recover (adjusted recovery rate = 1.37). By this calculation, compared with the estimated likely recovery time, a number of officers in this study were judged to be taking more than twice as long as expected, while some were judged to be taking half the time, or less. Whether they *actually* took half or twice the 'real' expected time is less relevant than that they were behaving counter to expectation considering the judged severity of the injury. Variation in recovery rate was found (Appendices P and FF) and this requires explanation. Interpretable themes regarding the social and psychological issues emerged from the analyses to account for part of this variation. The themes are discussed below, but before starting that discussion, it is important to fully understand the outcome measure used in this research.

In addition to variation in length of recovery, there is variation in the estimates provided by the medical adjudicators. Tables 6.3.2 and 6.3.3 present the correlations of the three best medical adjudicators' estimates with length of absence. It is clear that these are not perfect correlations but they never could be given the reasons discussed below. These particular estimates were chosen on the basis of their having the highest correlations with the actual length of absence. In a highly circular way, the only real test of external validity of these estimates is their relationship with length of absence, and length of absence is what the estimates are intended to predict in the study.

In not correlating perfectly with actual length of absence, it is impossible to know whether the estimates are 'out', or whether other non-clinical or even other clinical factors are influencing the length of absence. The first explanation is that

the doctors are not very good at estimating injury severity, however, in the present context they were asked to estimate recovery time from very scant information (Appendices C and E).

It may have been particularly difficult for them since doctors normally have access to the patient when making prognoses. In a further exercise to test the influence of additional information, two of the original medical adjudicators were offered additional clinical information about the injury which had been gathered in the clinical interview conducted by the nursing sister. This was presented in such a way that they could ask any facts about the case they thought important. None of the information about range of movement, or other parameters of that sort, were wanted: only the length of time (in the case of fractures) that the plaster was kept on was asked for. The addition of this information produced a moderate improvement in their estimates. The bases upon which doctors decide diagnosis and prognosis is a subject for quite separate study, but in the present context it is recognised that the medical adjudicators were provided with unusually limited information. This information was, however, no different than that presented to the registrars in the study by Brewin et al. (1983).

Further, as regards clinical issues, it may be that the course of recovery for certain of the officers was complicated as far as treatment is concerned. These sorts of factors could not possibly be known by the doctors from the limited information provided to them. Attending for further treatment, the necessity of which only becomes apparent after a time, waiting for hospital appointments and the development of infection would all delay recovery. The problem of estimating reasonable recovery time also rests on a concept of 'standard man'. Woodyard's estimates are based on recovery time for the 'average man in the average job' (1980a). The parameters provided in the present research to assist the medical adjudicators were a slight improvement on this in that the job (police officer) and the age range were provided. There are also individual differences in recovery time which are the consequence of physiological variation. Examples are differences in circulation, in metabolism, in the presence or absence of inflammation or anemia,

the weight or build of the person and, as far as rehabilitation is concerned, the ability to exercise. None of these are features of standard man.

As an illustration of possible problems with the estimation of recovery time, in the first study the average recovery time for fractures of the foot (n = 6) was two and a half times that expected; in the case of hand lacerations (n = 4), the subjects returned to work more quickly than that expected (Appendix Q). Why would that be? To accomplish all the walking that is required on the job, police officers cannot have pain in their feet, but they also need to use their hands, so the explanation cannot solely be due to ergonomic reasons. Could it be that the doctors 'see' fractures to the small bones of the feet as being inconsequential, while they 'see' a cut to the hand as quite serious. Certainly in the latter, there is the possibility of nerve and tendon damage. Quite possibly it may because the rehabilitation of a laceration to the hand is unpredictable. A laceration may require surgery or the sequelae may be quite benign. These factors would not be known from the brief description given to the medical adjudicators. It may be that they were erring on the side of the worst possible outcome.

Some of these difficulties could be surmounted by having the patients physically examined by the person making the estimates, and indeed the estimates provided by the nursing sister were a considerable improvement on the blind medical adjudicators. For the purposes of the research, this would have introduced access to and unquantifiable attention to non-clinical factors about the patient (see discussion in Chapter 6.3, examiner's estimates). Improvement in the important element of assessing injury severity is beyond the researcher's domain of expertise.

A second alternative is that which was proposed at the outset: the lack of a close relationship between likely recovery time and actual recovery time is the consequence of psychosocial factors. Given that, even a highly accurate or very good estimate of likely recovery time would fail to match the actual length of absence. That social and psychological features of the patient influence recovery

rate has been demonstrated in this thesis, but the question remains: to what extent? The regression analyses performed on the data suggest that about one third to a half of the variance in recovery rate in any group can be accounted for. The remainder is an amalgam of difficulties in nailing down the injury severity, measuring appropriate psychosocial factors, and possibly quite idiosyncratic influences, and an element of unpredictability.

Despite the elasticity in the measure, the use of adjusted recovery rate allowed clarification of some of the psychosocial factors which influence recovery rate. That they emerged, were interpretable, and fitted with previous research, attests to the strength of their relationship with recovery time.

10.9 The prediction of behaviour. The situation might be well summed up in the following way as it was by an orthopaedic surgeon, 'there appear to be a large number of individually important factors but each of these may only operate in a few patients and only a few of them apply in every patient' (Waddell, *private communication*). This would tend to make one believe that the search for factors which are general themes is elusive. This may be the case especially when trying to reconcile complex social and psychological factors to a linear model. In discussing the use of linear models in predicting outcomes, Dawes (1982) states that he finds it 'remarkable' that one is able to account for even 16% of the variance (in professional success from a variety of measures). He believes that the desire to make behaviour predictable is based on a mistaken and implicit assumption that it *is* predictable. The logical sequitur of this is that if some factor is not a particularly good predictor, then *something else might be.* 'Statistical prediction because it includes the specification (usually a low *r*) of exactly how poorly we can predict, bluntly strikes us with the fact that life is not all that predictable. Unsystematic clinical prediction (or 'postdiction') in contrast allows us the comforting illusion that life is in fact predictable'.

10.10 Implications for practice. The findings of the thesis indicate that, in general, people are attached to their work and wish to be there. If, through illness or injury they are unable to work, the process of recovery is a frustrating and distressing one. This is especially true if the convalescence is protracted. In a fundamental way, this contradicts popular perceptions. The fact of having been injured and then being forced into inactivity for the necessary period of time, is a threatening event and a chronic difficulty, as described in the life event literature. Being injured disturbs usual activities, including work, and it disturbs normal social relations. Most importantly, it often places the individual into an unaccustomed passive role. This introduces one of the main practical implications of the research. If employees are actually concerned about their work, and not enjoying being away from it and are anxious to return, then this would lead to a different attitude on the part of the employer. What this would point to is an interactive relationship between the employer and the employee in which he or she is not just forgtten about until he or she can function again. In other words a more active approach to rehabilitation is required.

An original idea behind this research was that if vulnerability could be identified in officers (in terms of particular dispositions or characteristics) then a screening instrument could be devised which would identify those officers 'at risk'. It seems, now, that this is a too simplistic approach to a very complex piece of human behaviour. From the findings in the thesis, people do seem to vary in their reponse to clinically similar injuries. This was, however, not identified as being the consequence of personal dispositions. Rather it would appear to be the consequence of the individual's appraisal of the whole situation. Psychological features of the convalescence, for instance the officers' attributions about the accident, or his or her relationships with people at work could be amenable to change.

A report of the research, published in the national *Police* magazine (Mitchell, 1990b), described the apparent rise in psychological symptoms during convalescence. This article was met with interest since it questioned some of the

basic assumptions about convalescence (described in Chapter 1 of this thesis). In terms of practice, data from the cross sectional study of convalescence indicate that the provision of temporary modified work may help to offset what can become the chronic problem of convalescence. Several of the practical implications of the research have already been incorporated into the working practice of the Medical Department at Strathclyde Police. An example of this is the encouragement of a return to suitable (part-time or lighter) duties for officers who are still recuperating but capable of carrying out some useful work. Previous practice was to leave the officer convalescing until 8 weeks had passed, at which time he or she would be reviewed by the Chief Medical Officer. From what is now known about the insidious psychological distress which can result from protracted absence, many problems would have already started and become entrenched by this time. Increasingly, these officers are contacted much earlier to obtain a better measure of their circumstances. In general, the move is towards a more active management of the convalescence on the part of the Medical Department and the officer him or herself.

Specifically of the convalescence, for instance the officer's attributions about the accident, or his or her relationships with people at work could be amenable to change. Specifically as regards officers who are assaulted, at present, there is no attention paid to what psychological sequelae there may be. Victims of crime in the community are now counselled under the auspices of the *Victim Support Scheme*, a voluntary service implemented because of a perceived need. Police officers, on the other hand are seen as being immune to emotional reactions, a reflection of some of the attitudes discussed in Chapter 8 of this thesis. The incidence of post traumatic stress disorder in police officers, or a marked increase in psychological symptoms of distress, after such experiences is beginning to be recognised (Duckworth, 1990). The data from this thesis in addition substantiates this view and demonstrates that there are not just psychological sequelae but there is also the potential for excessive loss of time from work. This could result in increasing loss of confidence and an anxiety about returning to work. Social and psychological support for police victims of assault in the form of early intervention could offset some of these difficulties.

10.11 The validity of the data. One of the more interesting findings in this thesis, and that which has the most immediate practical application, was that to do with the increase in psychological symptoms with the passage of time during convalescence. This finding has many implications for practice in managing convalescence and it also questions in a fundamental way many of the perceptions which exist about convalescents. Could it be, however, that there was bias in the reporting of the 60% of the sample who responded? Perhaps they were reporting a high level of psychological symptoms since they thought that this would be more appropriate to the state of convalescence? This issue and the potential that there may be additional problems of this sort when studying police officers was addressed to an extent in Chapter 3 (3.8a). That this is a real phenomenon rather than the consequence of dissembling can be argued from the similarity of these findings with those of the unemployment studies which also found an association of psychological symptoms with time. In this same vein, the convalescents reported a perceived lack of structure which is the same phenomenon which has been widely observed in the unemployed. As regards any concerns that the officers may have had about the researcher being part of the police authority rather than an independent researcher, they were quite open and spoke in a straightforward way. They showed no signs of being suspicious about why they were being interviewed, and they were relaxed about asking questions about the interview and seemed to accept and understand the answers. Many, indeed, were pleased to have someone to talk to. A response rate very close to one hundred per cent was obtained in both the prospective study and so no bias effects were possible in these samples; in the cross sectional study, however, the bias seemed to be towards those officers who were off work longer and who may have felt the distress of inactivity to a greater extent. Considering the systematic nature of the findings, however, their similarity to other findings with similar groups and the fact that the findings can be interpreted in a theoretically cohesive way supports the validity of the data.

10.12 Conclusions. The Introduction to this thesis proposed two possible conceptualisations of recovery (Section 1.6). One was a model of vulnerability. By

this perception, the injured person is, in some sense, 'an accident looking for a place to happen'. They are vulnerable, because of a number of personal dispositions, to a poor response to the injury. What that model would imply in behavioural terms is a protracted absence from work. This was the principle idea behind the research, which embarked on the quest to identify particular characteristics or attitudes on the part of the patient which would explain variation in recovery time. In the course of collecting other psychological measures, the person's history of previous illness or injury absence was also obtained. This, alone, was identified as a true pre-existing characteristic of the injured person that is predictive of recovery rate, and could be considered a vulnerability factor. The orientation of the research changed and in general, the findings of the research point in a different direction. Generally, the clinical hunches that medical practitioners have about the sorts of factors which can influence recovery rate were not substantiated.

It is a conclusion that generic concepts like 'patient motivation' and 'malingering' are not especially useful. Nor is it useful to think in terms of relatively static characteristics of patients which would pre-dispose to a poor recovery. It is acknowledged, however, that no statement can be made from the present research findings about the more general case. The findings are of course, reported in the context of the particular population studied and the size of the samples. In addition, the injuries were not severe and most did not lead to permanent or severe disability.

The findings point to the greater utility of the second model proposed in the Introduction: a reaction model. What did emerge as an important factor in recovery was the person's cognitive appraisal of the accident and where they lay the blame for its happening. The crucial element of this, however, is that this appeared to apply only in the context of injuries which happened at work. This might be explained by the relative homogeneity of a person's appraisal of a work injury. While an appraisal of an injury which happens during do-it-yourself activities, while driving or during sports activities might all be quite different and dependent

upon other contextual factors. The variation in these individual contexts would preclude the identification of consistent attributions, with consistent behavioural outcomes. Significantly, recovery from an injury off duty also did not appear to be related to any of the assumed psychological influences. Prediction of recovery from these injuries remains something of an enigma, and requires more investigation.

In summary it would appear that the vulnerability model of recovery is too simplistic. These findings shifted the emphasis in the research. This understanding of injury recovery in cognitive terms allows for individually different responses to injury and convalescence. Further research needs to be carried out in two areas. First, the sorts of factors which may be related to recovery from non work injuries requires further exploration. Second, research which examines recovery from work injuries is required which allows distinction to be made between attributions of culpability and the pursuit of compensation.

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List of Appendices

PLEASE INDICATE HOW MUCH YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS BY TICKING THE APPROPRIATE BOX.

People who get injured in some way and temporarily can't go to their work are usually in no hurry to get better.

[ ] strongly agree
[ ] agree
[ ] not sure
[ ] disagree
[ ] strongly disagree

People who get injured are quite often un-cooperative with the people who are trying to help them and they quite often don't comply with their medical treatment.

[ ] strongly agree
[ ] agree
[ ] not sure
[ ] disagree
[ ] strongly disagree

If the truth be told, being injured and off work gives people a well earned break from work, like an unexpected holiday.

[ ] strongly agree
[ ] agree
[ ] not sure
[ ] disagree
[ ] strongly disagree

People who get injured are usually interested in getting some financial compensation for their injury.

[ ] strongly agree
[ ] agree
[ ] not sure
[ ] disagree
[ ] strongly disagree

Malingering is quite a problem for employers. (*'malingering' means people staying away from work because of illness or injury beyond the time that it is absolutely necessary on medical grounds*)

[ ] strongly agree
[ ] agree
[ ] not sure
[ ] disagree
[ ] strongly disagree

Your age:

Male / Female

Your occupation (*if you are a student please say what course you are taking*)

Please write any comments you wish to make here:

Thank you for your help.

Thank you for helping us to study what it 'feels like' to be recovering from an injury or to have recently returned to work after recovery. Please be assured that your answers are CONFIDENTIAL and ANONYMOUS will not be seen by your employer or by any agency or person other than the researcher.

When were you injured? (day) (month) (year)

Please state the **type** of injury and **what** you injured - please give medical term if known, e.g. fractured tibia:

Do you think your injury is: [] minor [] moderate [] severe ?

When did you stop work? (day) (month) (year)

When did you resume work? (day) (month) [] not yet resumed

If resumed, are you: [] doing your usual duties
[] assigned to "light duties"

If on "light duties", when do expect to return to your normal job?
(day) (month) [] don't know

Please briefly describe what happened and the situation when you were injured.

. Thinking back, did you have any warning it was going to happen? [] yes [] no
What warned you?

. When it happened, did you feel:
Angry? [] yes [] no With what or whom?

Do you feel the same now? [] yes [] no

Fear? [] yes [] no Of what or whom?

Did you feel anything else?

. What do you think **caused** it?

. Which of these reflects who or what you think was **to blame** for it happening?

I was entirely to blame
I contributed to it happening but I was not entirely to blame
It was just a freak event with no clear explanation
Someone else or something else contributed to it happening but were not entirely to blame
Someone or something else was entirely to blame for it happening

Please mark on this scale of 0 to 100 how avoidable you think it was:

.....100
ompletely unavoidable completely avoidable

W WELL DO THESE STATEMENTS DESCRIBE YOUR ACTIONS BEFORE IT HAPPENED?

actions were in my opinion the proper ones under the circumstances
strongly disagree
disagree
don't know
agree
strongly agree

actions contributed to causing it
strongly disagree
disagree
don't know
agree
strongly agree

actions were unconnected with why it happened
strongly disagree
disagree
don't know
agree
strongly agree

actions had no effect on what happened
strongly disagree
disagree
don't know
agree
strongly agree

actions could have prevented it happening
strongly disagree
disagree
don't know
agree
strongly agree

actions were not up to my usual standards
strongly disagree
disagree
don't know
agree
strongly agree

actions were more careless than usual
strongly disagree
disagree
don't know
agree
strongly agree

actions were justified in my view
strongly disagree
disagree
don't know
agree
strongly agree

WHAT IS YOUR JOB AND ITS PHYSICAL REQUIREMENTS?

List the aspects of your job that are/were restricted by the injury (or none):

List the aspects of your social life that are/were restricted by the injury (or none):

List the aspects of your home life that are/were restricted by the injury (or none):

Do you expect to be injured carrying out your work?	[] yes	[] no
Do you expect to be permanently disabled by your work?	[] yes	[] no
Do you expect to be psychologically affected by your work?	[] yes	[] no

Has your injury changed any of your short or long term plans or goals? If so please state which.

Have any of your attitudes changed since your injury? If so please state which.

HOW SATISFIED ARE YOU WITH THE FOLLOWING ASPECTS OF YOUR JOB?

Type of work
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Physical work conditions
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Workmates
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Rate of pay
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Hours of work
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Supervisor
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

Considering every aspect of your job
[] very satisfied [] satisfied [] dissatisfied [] very dissatisfied

I quite often feel like walking out of my job for good
[] agree a lot
[] agree a little
[] not sure
[] disagree a little
[] disagree a lot

he **last year** have you had treatment or seen a doctor for "nerves" or emotional problems?
[] yes [] no

ur age: Your height: Your weight:

w many cigarettes do you smoke a day?
s the amount you smoke changed since you injury? [] less [] the same [] more [] n/a

at type of alcoholic drinks do you usually have (e.g. beer, spirits, wine)?

ng the following measures to describe 'one drink': two ounces of spirits, one glass of wine, one t of beer; how many drinks do you have each week?

w much money do you spend on drinks each week?
you think the amount you drink has changed since your injury?
[] less [] the same [] more [] n/a
you think the amount you eat has changed since the injury?
[] less [] the same [] more [] n/a

NKING ONLY ABOUT **NOW AND THIS PAST WEEK**, WHICH OF THESE STATEMENTS COMES OSEST TO HOW YOU HAVE BEEN FEELING? PLEASE PUT DOWN YOUR IMMEDIATE REACTION TO E STATEMENT WITHOUT THINKING TOO LONG ABOUT YOUR REPLIES

el tense or 'wound up':
most of the time
a lot of the time
from time to time, occasionally
not at all

ll enjoy the things I used to:
definitely as much
not quite so much
only a little
hardly at all

t a sort of frightened feeling as if something awful is about to happen:
very definitely and quite badly
yes, but not too badly
a little, but it doesn't worry me
not at all

n laugh and see the funny side of things:
as much as I always could
not quite so much now
definitely not so much now
not at all

rrying thoughts go through my mind:
a great deal of the time
a lot of the time
time to time but not too often
only occasionally

el cheerful:
not at all
not often
sometimes
most of the time

I can sit at ease and feel relaxed:
[] definitely
[] usually
[] not often
[] not at all

I feel as if I am slowed down:
[] nearly all the time
[] very often
[] sometimes
[] not at all

I get a sort of frightened feeling like butterflies in my stomach:
[] not at all
[] occasionally
[] quite often
[] very often

I have lost interest in my appearance:
[] definitely
[] I don't take as much care as I should
[] I may not take quite as much care
[] I take just as much care as ever

I feel restless and as if I have to be on the move:
[] very much indeed
[] quite a lot
[] not very much
[] not at all

I look forward with enjoyment to things:
[] as much as I ever did
[] rather less than I used to
[] definitely less than I used to
[] hardly at all

I get sudden feelings of panic
[] very often indeed
[] quite often
[] not very often
[] not at all

I can enjoy a good book or radio or TV programme:
[] often
[] sometimes
[] not often
[] very seldom

Are you:
[] single/separated/divorced
[] married/living with partner

IN THE PAST MONTH, HOW **HELPFUL IN PRACTICAL WAYS** HAVE THESE PEOPLE BEEN?

Wife/Partner
[] very [] somewhat [] not at all [] not applicable [] made things more difficult

Friends
[] very [] somewhat [] not at all [] made things more difficult

Workmates
[] very [] somewhat [] not at all [] made things more difficult

Supervisor
[] very [] somewhat [] not at all [] made things more difficult

IF THIS LEVEL OF PRACTICAL HELP IS DIFFERENT COMPARED WITH **BEFORE YOUR INJURY**, HOW HAS IT CHANGED?

Wife/Partner	[] less	[] no change	[] more
Friends	[] less	[] no change	[] more
Workmates	[] less	[] no change	[] more
Supervisor	[] less	[] no change	[] more

IN THE PAST MONTH, HOW **EMOTIONALLY SUPPORTIVE** HAVE THESE PEOPLE BEEN?

Wife/Partner [] not applicable
[] very [] somewhat [] not at all [] made things more difficult

Friends
[] very [] somewhat [] not at all [] made things more difficult

Workmates
[] very [] somewhat [] not at all [] made things more difficult

Supervisor
[] very [] somewhat [] not at all [] made things more difficult

IF THIS LEVEL OF EMOTIONAL SUPPORT IS DIFFERENT COMPARED WITH **BEFORE YOUR INJURY**, HOW HAS IT CHANGED?

Wife/Partner	[] less	[] no change	[] more
Friends	[] less	[] no change	[] more
Workmates	[] less	[] no change	[] more
Supervisor	[] less	[] no change	[] more

RECENT SETBACKS

Setbacks like those on the following list happen to everyone. If you have experienced any of these or anything of similar significance in the PAST YEAR (since June or July 1987), please mark the appropriate box and describe the two most significant setbacks in more detail below, specifying the date on which it happened.

[] broken off a steady relationship or had a marriage separation
[] death of parent, partner or child
[] death of close relative or close friend
[] close relative has/had serious illness or injury
[] crisis with housing or accomodation
[] theft, loss or damage of property
[] fight, argument, crisis or other serious problem with a partner, close friend, relative or neighbour
[] sudden major financial crisis (as distinct from a general shortage of money)
[] police court appearance or disciplinary enquiry
[] fight, argument or other problem with supervisor at work

(If you are quite sure that nothing like this has happened in the last year, please skip the next 'details' section and go on to "**considering**", lower down on this page)

Details of First Setback

a. **When** did it happen? (day) (month)

b. Please describe in some more detail what happened.

c. We often see things more clearly afterwards, but at the time did you have some warning that the setback was going to happen. [] yes [] no
What warned you?

d. Can you say what emotions you felt at the time?

e. One week afterwards, was it resolved or were you still having to cope with it and was it still going round in your mind? Rate from 0 to 100.

It was resolved Still having to cope with it
0.....100

f. What emotions did you feel one week afterwards?

Details of Second Setback

a. **When** did it happen? (day) (month)

b. Please describe in some more detail what happened

c. We often see things more clearly afterwards, but at the time did you have some warning that the setback was going to happen. [] yes [] no
What warned you?

d. Can you say what emotions you felt at the time?

e. One week afterwards, was it resolved or were you still having to cope with it and was it still going round in your mind? Rate from 0 to 100.

It was resolved Still having to cope with it
0.....100

f. What emotions did you feel one week afterwards?

Considering this past year and all the things that have happened during it, what would you say was the worst thing that has happened to you?

[] the injury
[] some other setback (which one?)

Would you say that you have had more than your fair share of setbacks and difficulties during this past year?

[] less than usual [] same as usual [] more than usual

Now I would like to ask you about any **GENERAL WORRIES OR PROBLEMS** that you have as distinct from the sudden setbacks that I asked you about above.

(If you have returned to work some of these worries may not be applicable - please mark N/A. For the other worries, please answer as you feel now, not how you felt while you were off).

PLEASE SAY HOW MUCH OF A PROBLEM THE FOLLOWING ARE FOR YOU JUST NOW?

Worrying about not knowing what is going to happen
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Finding useful ways to spend my time
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Living up to what others expect of me
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Keeping the family cheerful and contented
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Finding enjoyable things to do
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Worrying about whether I will be able to do my job again with this injury
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Worrying about losing my job skills while I am off work
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Worrying about what my workmates think of my being off work like this
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Worrying about what my supervisor thinks of my being off work like this
[] a big problem
[] a middling problem
[] a small problem
[] no problem

Hoping that my doctor really knows what is wrong with me and hasn't 'missing something' about my physical problem
[] a big problem
[] a middling problem
[] a small problem
[] no problem

THINKING ABOUT HOW YOU HAVE FELT **SINCE THE INJURY** COMPARED WITH HOW YOU HAVE USUALLY FELT IN THE PAST FEW YEARS,

(**NOTE:** For those who have returned to work, please answer as you feel now rather than how you felt when you were off).

HAVE YOU.....
Been able to concentrate on whatever you're doing?
[] better than usual
[] same as usual
[] less than usual
[] much less than usual

Lost much sleep over worry?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Felt that you're playing a useful part in things?
[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

Felt capable of making decisions about things?
[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

Felt constantly under strain?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Felt that you couldn't overcome your difficulties?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Been able to enjoy your normal day-to-day activities? (apart from because of physical problems)
[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

Been able to face up to your problems?
[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

Been feeling unhappy and depressed?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Been losing confidence in yourself?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Been thinking of yourself as a worthless person?
[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

Been feeling reasonably happy all things considered?
[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

Thank you very much for spending the time to do this. I am particularly interested in any other thoughts or worries that you might have about your convalescence or in anything else that is bothering you just now. If any of your plans or goals for the future have been affected by the injury could you please tell me what those are. Please use this space (or you might add on an extra piece of paper) to describe any other things that you wish to say about your situation.
Thank you again, I am sure this research will be very useful in helping to understand convalescence and the sorts of problems people have while recovering.

Estimates of probable recovery times for common injuries.

Please estimate probable recovery times to the nearest week for these 82 injuries. The 'cause' provides information about the mechanism of the injury. To help you think about the injuries in the context of a 'real' patient, all the subjects in this study are police officers on the beat and all but 6 are male. Eighty two percent (82%) of the sample are 40 years old or younger, no one is over 50 years. In the descriptions of the injuries, if right or left is specified then this indicates that the injury site is the upper limb.

At the end there is space for you to describe how, in general, you made the estimates. For example, what aspects of the descriptions did you attend to and what factors would make you think that one injury would take the person longer to recover from than another?

It is very important that you try to give an estimate for each injury - even though in some cases you may feel there is insufficient information.

Thank you.

3
Fracture of os calcis
Contusion to back

Cause fell from height

6
Fracture of shaft of 5th metatarsal

Cause stumbled on step and fell

7
Chip fracture of left olecranon

Cause elbow caught in hinge of car door

8
Sprained ligaments of ankle
Stretched achilles tendon

Cause inversion of ankle

10
Closed dislocation of right shoulder

Cause arm wrenched backwards

11
Three deep open lacerations of thigh and lower leg

Cause dog bites

12
Fracture of right radius

Cause fell on stairs

13
Fracture of 4th right distal phalanx
Compound fracture to right 5th shaft

Cause fell on stairs

14
Sprained ligaments of ankle

Cause inversion of ankle when landed after jump

16
Sprained ligaments of ankle

Cause strain caused by being pushed from behind

17
Fracture of right phalanx (subsequent 10% loss of mobility of flexor tendon)

Cause kicked

18
Torn ligaments of left shoulder (previous dislocation same shoulder: 1985 and 1988)

Cause footing sliped while on a high wall and tried to break fall by grabbing top of wall

20
Considerable abrasion and bruising of lower leg
Considerable abrasion and bruising of left arm

Cause fell astride a 4' high wall after slipping while running along it

25
First degree Potts' fracture of fibula

Cause struck by person landing on leg

26
Fracture of right index and middle phalanges

Cause was pushed and fell

27
Muscle strain of left upper arm

Cause strenuous movement

31
Dislocation of right thumb
Stretched tendons

Cause was kicked

34
Medial ligament sprain
Stretched and bruised cartilage of knee, floating particle of bone

Cause was pushed from behind and fell

35
Fracture of right scaphoid

Cause was pushed and fell

36
Lacerations of right upper arm (the largest was 6" across and resulted in deep exploration and muscle suturing)

Cause arm pushed through glass door

38
Sprained ligaments of ankle

Cause inversion of ankle then kicked on ankle

40
Torn ligaments of left elbow

Cause fell on slope

41
Closed dislocation of patella

Cause was pushed while off balance and fell

42
Open Bennett's fracture of left thumb

Cause collided with another person

44
Fracture of 5th phalanx of foot
Sprained ankle ligaments

Cause slipped and fell

45
Bruised knee

Cause blow by object

46
Fracture of 5th right metacarpal

Cause was kicked

47
Fracture of mid shaft of humerus

Cause fell by slipping on slope then landed on low wall

49
Fracture of 2nd and 3rd metatarsals

Cause tripped and fell

50
Fracture of left 5th metacarpal

Cause pushed against metal gate

51
Knee contusion
Chest contusion (caused by seat belt)
Small laceration to forehead

Cause RTA

52
Fracture of left scaphoid

Cause slipped and fell

53
Fracture of right thumb

Cause fell on slope

54
Sprain of medial ligament of knee
Inflammation of cartilage

Cause slipped and fell

56
Sprained ligaments of left wrist

Cause tripped over low wall and fell

57
Inflammation of articular surface of shoulder joint (previous fracture of humerus on same side)

Cause blow to shoulder

58
Fracture of left metacarpo-phalangeal joint of thumb, shaft of left proximal phalanx and left 5th terminal phalanx

Cause fell on hand, then crush injury to hand

61
Fracture of right scaphoid

Cause pushed then fell

62
Bennett's fracture of right MCP joint
Scaphoid.
Cause collided with other person causing hyperextension

63
Laceration of right ring finger
Flake fracture of distal phalanx

Cause caught in car door

64
Fracture of lateral malleolus

Cause tripped and fell

66
Fracture of right metacarpal

Cause struck by object

69
Strain of Achilles tendon

Cause strain while standing on ladder

70
Severed flexor tendon of right 5th finger

Cause cut with knife

71
Chip fracture of trapezium of right wrist

Cause struck by object

72
Laceration of right palm (2" crescent shaped cut from base if thumb to 'pinky' finger, possible nerve damage)

Cause fell from one level to another on to a broken glass

74
Sprained ligaments of ankle

Cause fell on stairs

76
Fracture of left scaphoid

Cause stumbled and fell

79
Fracture of right 5th metacarpal

Cause kicked

80
Sprained ligaments of ankle

Cause inversion of ankle after landing from jump

82
Transverse fracture of 5th metatarsal

Cause inversion of ankle after landing from jump

83
Torn meniscus (subsequently removed)
Cartilage strain of medial aspect of knee

Cause strain caused by bending

84
Fracture of right humerus

Cause fell on stairs

85
Fracture of right scaphoid
Ligament and tendon strain of ankle

Cause fell off motor cycle in solitary RTA

87
Fracture of lateral malleolus

Cause was pushed and fell

88
Fracture of right humerus
Fracture of right radius

Cause was pushed and fell

89
Sprain of right shoulder and scapula (has progressive osteoarthritis, strained shoulder 4 months previously)

Cause strain from pulling heavy object

90
Fracture of left wrist
Fracture of sternum

Cause RTA

93
Crush fracture of left proximal phalanx

Cause dog bite

94
Dislocation of knee and strained muscles

Cause fell from height

96
Strained ligament in anterior area of ankle
Tenosynovitis

Cause fell off low wall

97
Torn ligaments in ankle

Cause tripped on uneven ground and fell

98
Fracture of right 3rd metacarpal

Cause caught in door

99
Abrasion to thigh

Cause caught between two very slowing moving vehicles

102
Ligament strain to right thumb and wrist

Cause strenuous movement cause by puting hands out to protect self in RTA

103
Fracture of 3rd, 4th and 5th proximal phalanges,
Fracture of trapezium
Fracture of capitate

Cause fell from one level to another

104
Ligament sprain to right thumb
(later diagnosed as de Quervain's syndrome, this injury was superimposed on fracture to wrist and hand when shut in car door 8 months previously)

Cause stumbled and fell

105
Fracture to left scaphoid

Cause pushed against wall

106
Torn ligaments of ankle

Cause inversion of ankle

107
Strained ligaments of knee

Cause strain while jogging

111
Strained knee at popliteal space

Cause stumbled and fell

113
Strained acromio-clavicular joint of right shoulder

Cause fell from one level to another by tripping over fence, then landing on a boulder

116
Torn ligaments of ankle (superimposed on previous ligament sprains)

Cause strain caused by being pushed

117
Fracture of right scaphoid

Cause struck by object

119
Fracture of left 5th distal phalanx
Strained wrist

Cause blow during struggle with other person

120
Laceration to base of right thumb and right 5th finger
Tendons damaged - A.P.L. and A.P.B.
Ulnar nerve division

Cause hand went through glass door

123
Sprained ligaments of ankle (previous same ankle injury in RTA 1987)

Cause stumbled causing strain

124
Flake fracture of lateral malleolus
Torn ligaments of ankle

Cause inversion of ankle

125
Fracture of left scaphoid

Cause stumbled and fell

127
Fracture of 4th and 5th metacarpals
Sprained ligaments of ankle

Cause struck by person then fell

128
Fracture of base of 5th metatarsal

Cause fell up stairs

129
Sprain of knee

Cause Strain caused by running on rough ground

Comments: Can you describe how you made the decisions you did? What aspects of the descriptors did you attend to, what would make you think that one injury would take the person longer to recover from than another?

PLEASE WRITE THE DATE HERE:

Please describe the work you do and its physical requirements.

How satisfied are you with the following aspects of your work?

Type of work

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Physical work conditions

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Workmates

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Rate of pay

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Hours of work

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Supervisor

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Considering every aspect of your job

[] very satisfied
[] satisfied
[] dissatisfied
[] very dissatisfied

Do you agree with the statement: "I quite often feel like walking out of my job for good"

[] agree a lot
[] agree a little
[] not sure
[] disagree a little
[] disagree a lot

If you do feel like walking out, what sort of thing makes you feel this way?

Do you expect to be psychologically affected in a negative way by your work?

[] yes [] no

Up until your injury, did you manage all physical aspects of your work?

[] no problems
[] some minor problems (which)
[] not really managing well at all (why)

If you are regularly active in any sports, which sports do you do and how many hours a week do you devote to the sport/s and training for it?

Your relationship

[] no steady relationship
[] married/living with partner
[] a steady relationship but not living together

If you have a steady relationship, are married or living with a partner, how would you describe your relationship?

[] very good
[] no better, no worse than anyone else's
[] not going very well

Usually, how helpful in practical ways is this person to you? (For example: solves practical problems, relieves you from doing things you would normally have to do)

[] very
[] somewhat
[] not at all
[] makes things more difficult

Usually, how emotionally supportive is this person to you? (e.g. makes you feel appreciated and accepted, that you can talk things over with them)

[] very
[] somewhat
[] not at all
[] makes things more difficult

Thinking about the other people in your life. In the past month or so, (before your injury) how helpful in practical ways have the following people been?

Friends

[] very
[] somewhat
[] not at all
[] made things more difficult

Workmates

[] very
[] somewhat
[] not at all
[] made things more difficult

Supervisor

[] very
[] somewhat
[] not at all
[] made things more difficult

In the past month, (before your injury) how (emotionally) supportive have these people been?

Friends

[] very
[] somewhat
[] not at all
[] made things more difficult

Workmates

[] very
[] somewhat
[] not at all
[] made things more difficult

Supervisor

[] very

[] somewhat

[] not at all

[] made things more difficult

Do you feel confident that you have one person in whom you can confide just about anything? [] yes [] no

Thinking now about some of the things that you might have had to deal with during this past year.

Setbacks like those on the following list happen to everyone. If you have experienced any of these or anything of similar significance in the **past year** (since this month 1988), please mark the appropriate box and **describe the two most significant setbacks in more detail below and on the next page, it is very important that you specify the date on which it happened.If you can't remember try and give the week as close as you can.**

[] broken a steady relationship / marriageseparation

[] death of parent, partner or child

[] death of close relative or close friend

[] close relative has/had serious illness / injury

[] crisis with housing or accomodation

[] theft, loss or damage of your property

[] fight or argument with partner, close friend or other relative

[] sudden crisis or major worry about partner, a close friend or other relative

[] sudden major financial crisis *(as distinct from a general shortage of money)*

[] disciplinary enquiry

[] fight, argument or other problem at work

(If you are quite sure that nothing like this has happened in the last year, please skip the next 'details' section and go on to section beginning **"considering"**, *on next page)*

Details of First Setback

a. On what date did the setback happen?

b. Can you please describe in some more detail what happened?

c. We often see things more clearly afterwards, but at the time did you have any warning that this was going to happen? [] yes [] no

d. Can you describe any other relevent events that led up to this happening?

e. Sometimes we can bring things on ourselves by our own actions, in this case, do you think:

[] you caused it to happen
[] you contributed to it happening
[] you and another person equally contributed
[] another person caused it to happen
[] not applicable

f. If the setback directly involved another person (e.g. a death, illness or argument) **how often did you usually see that person before the setback happened?**

[] stranger
[] seen less than once a year
[] seen once a month
[] seen once a week
[] seen daily
[] current household member
[] not applicable - you were the only person involved
[] not applicable - only involved an object not a person

g. Occasionally setbacks have the effect of resolving a major difficulty or worry. Did the setback that you had resolve something that had been a worry or on your mind a lot?

[] yes [] no [] not applicable

h. **Can you say what emotions you felt <u>at the time</u>?**

i.i. **One week after this happened, was it resolved // was still going around in your mind and you were still having to cope with it?**

j. **What emotions did you feel <u>one week afterwards</u>?**

Thinking only about how you have been generally feeling recently compared with how you have usually felt over the last year,

Have you.....

.....been able to concentrate on whatever you're doing?

[] better than usual
[] same as usual
[] less than usual
[] much less than usual

...lost much sleep over worry?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...felt that you are playing a useful part in things? ***(other than because of any physical restrictions)***

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

.....felt capable of making decisions about things?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

.....felt constantly under strain?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...felt that you couldn't overcome your difficulties?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been able to enjoy your normal day-to-day activities? ***(other than because of any physical restrictions)***

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

...been able to face up to your problems?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

.....been feeling unhappy and depressed?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

....been losing confidence in yourself?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

....been thinking of yourself as a worthless person?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

....been feeling reasonably happy all things considered?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

YOUR INJURY.

Please describe what happened and the situation when you were injured - also whether it was on or off duty.

Thinking back, did you have any warning it was going to happen? [] yes [] no

At the time the incident happened, did you feel:

Anger? [] yes [] no

With what or whom?

Fear? [] yes [] no

Of what or whom?

Did you feel anything else?

Now, today, when you think about the incident, do you feel any particular emotion? (e.g. fear, annoyance, anger or anything else)

Now, how much do you think about the circumstances of the incident - never or does it keep going around your mind, sort of re-living the incident?

[] don't think about the incident at all

[] occasionally think about the incident

[] think about the incident quite often

[] can't stop thinking about it

Who or what do you think *caused* the incident in which you were injured?

[] caused entirely by you

[] you contributed to causing it but were not the sole cause

[] you don't know who or what caused it

[] some other person or thing contributed to causing it but they were not the sole cause

[] caused entirely by some other person or thing

Do you think that you or someone can/should be *blamed* for the incident happening and possibly feel some guilt about it?

[] you can/should be blamed

[] you deserve some blame but not all of it

[] no one can/should be blamed

[] some other person deserves some blame but not all of it

[] some other person should be blamed

Do you think that you were fully concentrating on the task at hand when the incident happened?

[] yes [] no

How avoidable do you think the incident was?

Do you expect to be injured in any of your activities? [] yes [] no

If so, which ones ? (e.g. work, sports)

Thinking about what you did before and during the incident in which you were injured, how well do these statements describe your actions and behaviour?

Please tick the boxes to indicate how much you agree or disagree with the statements.

Your actions contributed to causing the incident

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Your actions were unconnected with why the incident happened

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

In your opinion, your actions were the proper ones under the circumstances

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Your actions had no effect on what happened

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Your actions could have prevented it happening

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Your actions were not up to your usual standards

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Your actions were more careless than usual

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

In your opinion, your actions were justified

[] strongly disagree
[] disagree
[] don't know
[] agree
[] strongly agree

Now a few questions about your general health and your smoking and drinking habits.

Thinking about a usual week for you, how many cigarettes did/do you smoke each day?

Thinking about a usual week for you, and using the following measures, how many drinks did/do you have? (please tick if you had that type of drink and say how many)

[] a single whisky number: none []
[] a glass of wine number: none []
[] half a pint of regular beer
number: none []
[] half a pint of special lager

number: none []

Your height:

Your weight

Thinking only about today and this past week, which of these statements comes closest to how you have been feeling? Please put down your immediate reaction to the statement without thinking too long about your replies.

I feel tense or 'wound up':

[] most of the time
[] a lot of the time
[] from time to time, occasionally
[] not at all

I still enjoy the things I used to:

[] definitely as much
[] not quite so much
[] only a little
[] hardly at all

I get a sort of frightened feeling as if something awful is about to happen:

[] very definitely and quite badly
[] yes, but not too badly
[] a little, but it doesn't worry me
[] not at all

I can laugh and see the funny side of things:

[] as much as I always could
[] not quite so much now
[] definitely not so much now
[] not at all

Worrying thoughts go through my mind:

[] a great deal of the time
[] a lot of the time
[] time to time but not too often
[] only occasionally

I feel cheerful:

[] not at all
[] not often
[] sometimes
[] most of the time

I can sit at ease and feel relaxed:

[] definitely
[] usually
[] not often
[] not at all

I feel as if I am slowed down (other than because of any physical restrictions):

[] nearly all the time
[] very often
[] sometimes
[] not at all

I get a sort of frightened feeling like butterflies in my stomach:

[] not at all
[] occasionally
[] quite often
[] very often

I have lost interest in my appearance:

[] definitely
[] I don't take as much care as I should
[] I may not take quite as much care
[] I take just as much care as ever

I feel restless and as if I have to be on the move:

[] very much indeed
[] quite a lot
[] not very much
[] not at all

I look forward with enjoyment to things:

[] as much as I ever did
[] rather less than I used to
[] definitely less than I used to
[] hardly at all

I get sudden feelings of panic:

[] very often indeed
[] quite often
[] not very often
[] not at all

I can enjoy a good book or radio or TV programme:

[] often
[] sometimes
[] not often
[] very seldom

THANK YOU VERY MUCH
FOR YOUR HELP

Estimates of probable recovery times for common injuries.

Please read this carefully: Please estimate a probable and typical recovery time for each of the 54 injuries listed below. 'Recovery time' is defined as the period of time off work, from the time of the injury until the patient can be 'signed off' to return to regular duties. The following list describes injuries which happened to males employed as police officers; some of the injuries occurring off duty and some on duty. Please do not consider or try to guess whether the injury happened on or off duty, but just concentrate on the physical description of the injury. You can provide the estimate, which you should write beside the injury description, in days or to the nearest week. If knowing the mechanism of the injury helps you to make an estimate, this information is provided by the 'cause'. To help you think about the injuries in the context of a 'real' patient, 87% of the sample are 40 years old or younger, the modal age being 31 years.

It is very important that you provide an estimate for each injury even though, in some cases, you may think that there is insufficient information.

Thank you.

1
Extensive bruising right elbow

Cause pushed and fell

2
Puncture wound in thigh

Cause hand drill thrown at thigh, drill bit punctured and snapped off

3
Fractured os calcis

Cause fell from 8' height

4
Fractured fibula

Cause kicked on ankle

5
Flake fracture of ankle

Cause collision with other person

6
Fractured collar bone

Cause fell to ground from swerving motorcycle travelling slowly

7
Ligament strain ankle

Cause slipped, then twisted ankle

8
Fractured proximal phalanx of right 5th finger

Cause fell on hand

9
Fractured right metacarpal

Cause blow by object

10
Fractured 2nd right metacarpal

Cause hand stamped on by other person

11
Laceration of nerve between thumb and forefinger

Cause cut with can

12
Fractured shaft of fibula

Cause kicked

13
Fractured lateral malleolus

Cause inversion

14
Amputation of tip of right ring finger

Cause standing on ladder, fell off trapping tip of finger

15
Severed extensor tendon right middle finger

Cause Cut with glass

16
Torn interosseus muscles of foot
Back ligaments strained, protrusion of inverterbral disc

Cause stubbed foot into ground while running

17
Fractured shaft of left radius
Back strain

Cause fell 10 feet

19
Fractured right scaphoid

Cause punched object travelling at speed

20
Fractured lateral malleolus

Cause foot caught in pothole

21
Torn ligaments and cartilage in knee

Cause twist during fall

22
Surgery to remove cartilage in knee after torn cartilage

Cause previous twist injury, then kicked by person

23
Spiral fracture of fibula

Cause fell off skidding motor cycle

24
Torn ligaments in ankle

Cause twist

25
Pulled deltoid muscle in shoulder and upper right arm (superimposed on chronic back strain)

Cause arm wrenched

26
Whiplash

Cause RTA

27
Fractured distal end of humerus

Cause pushed then fell

28
Fractured mid shaft of fibula

Cause pushed against surf board by strong wave action

29
Dislocated right thumb, damaged tendons

Cause while running, thumb caught in other's clothing and pulled backwards

30
Fractured head of 5th metatarsal and phalanx in second toe

Cause stubbed foot

31
Ligament strain of ankle

Cause fell during struggle

32
Fractured 5th metatarsal

Cause slipped and fell

33
Acromio-clavicular subluxation (left)

Cause ran into object

34
Ligament strain to ankle

Cause inversion falling off pavement

35
Chest bruising
Sprained ankle

Cause RTA

36
Crack of humerus
Nerve compressed

Cause struggle with person

37
Effusion of knee

Cause fell

38
Effusion of knee, torn cartilage

Cause landed on feet from parachute jump

39
Fractured three fingers in left hand

Cause direct blow with object

40
Fractured medial malleolus
Fractured scaphoid right wrist

Cause RTA

41
Fractured right ulna

Cause footing slipped, hit arm on bath

42
Avulsion of extensor tendon of right ring finger, bruised middle finger and distal phalanx

Cause struggle with person

43
Fractured left olecranon

Cause slipped landing on elbow

44
Fractured left proximal phalanx

Cause ran into object

45
Fractured 1st metatarsal sesamoid

Cause tripped and fell while running

46
Crack of left scaphoid

Cause glancing blow with heavy object

47
Bimalleolar Pott's fracture

Cause kicked

48
Tenosynovitis abductor tendon of right wrist and thumb

Cause hammering

49
Haematoma calf muscle
Swollen knee joint and wrist

Cause RTA

50
Chip fracture to head of 5th metatarsal

Cause tripped and slipped

51
Strained ligaments in knee joint

Cause twist and fall to ground

52
Fractured right 5th metacarpal

Cause struck on hand

53
Fractured os calcis
Fractured talus

Cause feel from 8' wall

54
Strain of medial ligament in knee

Cause recurrent re-injury since initial twist injury one year prior

55
Inflammation elbow joint

Cause fell during struggle, arm banged on to fence

How did you make the estimates: Can you describe how you made the decisions you did? What aspects of the descriptions did you attend to? What would make you think that one injury would take the person longer to recover from than another?

Name: Date: Home/ HQ/ Phone

First of all, if its alright, I would like to ask you about your job what you think of it and so on. You are a ..... at..... (station, division)?

Job Satisfaction. There are various aspects to your job, you might be quite happy with some aspects but not so happy with others. I am going to read out some statements describing these aspects and, thinking of your job as a ....., I would like you to tell me how satisfied or how dissatisfied you feel with each by rating them 1 to 7. 1 means extremely dissatisfied and 7 means extremely satisfied.

1 - I am extremely dissatisfied
2 - I'm very dissatisfied
3 - I'm moderately dissatisfied
4 - I'm not sure
5 - I'm moderately satisfied
6 - I'm very satisfied
7 - I am extremely satisfied

(integer) Scores for each job satisfaction item

[ ]	PHYS	The physical work conditions (the equipment you have or physically what you have to do)
[ ]	FREE	The freedom to chose your own method of working
[ ]	COLS	Your fellow workers
[ ]	RECOG	The recognition you get for good work
[ ]	SUPER	Your immediate supervisor
[ ]	RESP	The amount of responsibility you are given
[ ]	PAY	Your rate of pay
[ ]	ABILIT	Your opportunity to use your abilities
[ ]	RELAT	How you see relations between supervisors (sgts. or insps.) and lower ranks in the police
[ ]	PROM	Your chance of promotion
[ ]	MANG	The way the police authority is managed
[ ]	SUGG	The attention paid to suggestions you make
[ ]	HOURS	Your hours of work
[ ]	VARI	The amount of variety in your job
[ ]	SECUR	Your job security
[ ]	WHOLE	Taking everything into consideration, how do you feel about your job as a whole

(integer)

[ ]	TOTJS	Total job satisfaction (add all 16 scores)

Jahoda's aspects of work respondent misses now he is off work. Now that you have been off work for a few days is there anything that you find you miss about your job - the sorts of secondary benefits of working other than earning money - or nothing really?

Statement:

(categorical)

What about the structure on your time?

[ ] **STRUCT** Time structure imposed by the working day

The social contact outside of the family (with colleagues or the public)?

[ ] **COLCON** Social contact outside of family with colleagues

[ ] **PUBCON** Social contact outside of family with public

Having something to do?

[ ] **ENFACT** Enforced activity, having something to do

Your role as a police officer in the community (maintaining law and order, protecting the community)?

[ ] **GOALS** Goals other than personal ones

The status of "being someone", of having an identity, wearing your uniform every day?

[ ] **IDENTIT** Identity (and status) as a policeman

Work commitment. For some people work is solely a means to get money, its something they just put up with while for others their work is the centre of their lives. I am going to read out statements people have made about working life in general and I would like you to indicate on this scale how strongly you agree or disagree with each statement as it applies to you, leaving aside your own particular job and not limiting yourself to thinking about it.

1 no, I strongly disagree
2 no, I disagree quite a lot
3 no, I disagree just a little
4 I'm not sure about this
5 yes, I agree just a little
6 yes, I agree quite a lot
7 yes, I strongly agree

[ ] Even if I won a great deal of money on the pools I would continue to work somewhere

[ ] Having a job is very important to me

[ ] I would hate to be on the dole

[ ] I would soon get bored if I had no work to do

[ ] The most important things that happen to me involve work

[ ] If unemployment benefit was really high I would still prefer to work

(integer)

[ ] **WRKCOM** Total work commitment (add six scores)

Financial solvency. I would like to ask you how adequate your total family income has been recently to provide things that you want or need. I hope you don't mind answering that. I have a list of statements which describe people's financial situation. Could you please choose the one which best describes your situation.

5 We met all bills and we can buy all the things that we want
4 We met all bills and we can buy most of the things that we want
3 We met all bills but we can't afford luxuries or extras *(like presents, meals out)*
2 It is a struggle to pay bills
1 We often can't pay bills

(integer)
[ ] **FINSOLV**

Number and depth of interests. Now about your regular hobbies and interests. Some people have interests that are *very* important to them and they get fed up if they can't do them, perhaps they might like to do them a lot more. Fly fishing, playing a musical instrument or closely following a sport would be examples. Would you say that you have a interest which is important to you?

INTER (categorical)
[ ] NO INT really has no identifiable regular interest *(go to "what done most in spare time")*
[ ] HAS INT can identify a regular interest

What is interest:
Statement:

Type of interest: Do you carry out this activity mostly indoors or outdoors and is it something you do along or with other people.

INTTYP (categorical)
[ ] IND indoors
[ ] OUT outdoors

Social interaction involved in activity:

INTSOC (categorical)
[ ] SOL solitary
[ ] ONE with one other
[ ] GRP with group

Time spent on interest. Usually when you are working and not off sick, on how many days a week do you spend time - more than about half an hour - on your interest?

1 one day a week
2 two days a week
3 three days a week
4 four days a week
5 five days a week
6 six days a week
7 daily

(integer)
[ ] **INTDYS** number of days each week spends time on interest

Like to spend more time on interest. Would you like to spend more time on your interest or do you think that you spend enough time on it?

INTTIM (categorical)
[ ] ENO respondent feels he spends enough time on interest
[ ] MOR would like to spend more time

What prevents more time at interest. If you would like to spend more time, what stops you?
Cross question: Are you stopped by your shifts, other family commitments, your own motivation?
Statement:

What done most in spare time. On what do you spend most of the time when you are not working?
Cross question: For example you might spend time with your family or watching television.
Statement:

Domestic situation:
DOM (categorical)
[ ] MARR married / co-habiting
[ ] OTHER lives with others (friends, relatives)
[ ] LODGE lives alone in lodgings
[ ] ALONE lives alone in flat or house

Number of children (Ages):
Wife working. Does your wife work?

WIFWRK (categorical)
[ ] WFPT part time
[ ] WFFT full time

Type of accommodation. Is your home rented [RENT]; police owned [POL] or your own [OWN]

Feeling adequate at home *(if married)*: I have here two statements that people might say about their interaction with their family. I would like you to tell me if either of these is in any way a problem for you, and if so how much.

1 a big problem
2 a middling problem
3 a small problem
4 no problem

(integer)
[ ] **FAMCHR** Keeping the family cheerful and contented

(integer)
[ ] **OTHEXP** Within my family, living up to other people's expectations

Tension at home *(do not ask if living alone)*: How comfortable and relaxed do you feel when you are at home, that is usually while you are working and not convalescing. In some people's homes there is quite a lot of tension, there are fights, silences and such like, in some other people's homes this is quite rare.
Cross question: How often would you say there is tension in your home - or does everyone get along fine. Do you ever find that you avoid going home, or make excuses for not being there.

1 completely relaxed and comfortable; gets along well with everyone in the house, no avoidance or tension, rather be home than anywhere else

2 mostly feels relaxed and comfortable; usual family tension, e.g. someone in house gets on nerves, less frequently that about once every two months

3 feels relaxed and comfortable more often than not; usual family tension, e.g. someone in house gets on nerves about once every two weeks to every two months, doesn't avoid going home. Overt quarrels rare, i.e. < 1 every two weeks

4 feels relaxed and comfortable some of the time; tension manifested as silent tension or overt quarrels or both more than once every two weeks, overt quarrels > 1 every two weeks

5 rarely feels relaxed and comfortable; avoids being home once or twice a week, tension manifested as silent tension or overt quarrels or both once a week

6 not at all relaxing, uncomfortable; thinks of leaving home more than once a month, frequently avoids home, frequent quarrels each week; silent tension / quarrels / both

(integer)
[ ] **HMTENS** Tension at home

Social Interaction. I'd like, now, to get an idea of the number of people with whom you spend your social time, that is outside of working hours, other than those you live with and see anyway. These would be people whose company you seek and whom you see quite regularly. Approximately how many people would you see socially and fairly regularly over the period of a normal week - that is *before* you had this injury. *(get number then fit into category)*

(integer)

[ ] **NUMPEOP** estimated number seen

0 none or very few interactions with people at work and outside of work / home, a loner

1 only at work, don't choose these people, but feel friendly to them while there, no, or very limited, social contacts while not at work

2 friends and / or relatives seen less than once a week, perhaps with no great emotional involvement, e.g. wife's friends, mother in law, no close friends, work mates

3 football team, bowling club, fishing club, darts club

4 friends and / or relatives seen quite casually more than once a week

5 sees friends and relatives including one or more close friends, including people or a person to whom you can talk about almost anything, such as trouble at home, or special things like achievements, that you would see more than once a week (depending on shifts), who you enjoy being with and you miss them if you don't see them.

(integer)

[ ] **SS** Social support

Bolton Time Management Questionnaire. People plan and manage their time in different ways. I am going to read out some statements that people have made and, thinking about now - that is while you are convalescing - could you say of you agree or disagree with them as they apply to yourself now.

1 no, I strongly disagree
2 no, I disagree quite a lot
3 no, I disagree just a little
4 I'm not sure about this
5 yes, I agree just a little
6 yes, I agree quite a lot
7 yes, I strongly agree

[ ] I have been arriving early for things like meeting people or appointments (1).
[ ] I feel guilty if I sleep late when I should get up (2).
[ ] I have been finding it hard to get started on things (3).
[ ] I know what to expect of the future (4).
[ ] I have been getting up when I intend to (5).
[ ] I have great confidence in my future (6).

[ ] I have difficulty filling time (7).
[ ] The future is too uncertain for me to plan far ahead (8).
[ ] I find it difficult to get things done without deadlines (9).
[ ] I look forward to each day (10).
[ ] I have a sense of myself waiting for something to happen (11).
[ ] I have been getting up at the same time whether necessary or not (12).
[ ] I feel anxious if I am not certain of the time (13).

[ ] Self motivation (items 3, 9)

[ ] Ease with time (items 6, 7, 10)

[ ] Mastery over time (items 1, 11, 13)

[ ] Regularity of rising (items 2, 5, 12)

[ ] Predictability of future (items 4, 6, 8)

The Injury. Now to ask you about what you were doing and how you were injured. If you have no objection I would like to tape record this part and I assure you that this is just for the purposes of the research and the tape will be cleaned off as soon as I have listened to it. I would like to get the story, regardless how brief, in your own words so would mind saying again what you were doing and how you were injured?

Injury warning. Did you have any warning that you were going to be injured?

WARN (categorical)

[ ] NO WARN respondent cannot remember any warning that he was going to be injured
[ ] YESWARN respondent can remember some warning that he was going to be injured

Injury rumination. Since you were injured, have you thought very much or thought at all about the situation in which you were injured.

1 not at all
2 only when people ask what happened
3 quite a lot

(integer)

[ ] **THINK** amount the respondent thinks about situation in which injured

Injury anger. At the time it happened, or since then have you felt angry or annoyed with anyone or anything about being injured?

Cross question: You might have felt angry only at the time, or perhaps you might have continued having thoughts against someone. Wanting to get even - that sort of thing. You might not have felt as strongly as anger but only felt annoyed which would involve thinking about it for less than a day or perhaps feeling some annoyance that it had happened at all. Having thoughts when you haven't meant to? How often? How difficult do you find it to get them out of your mind?

0 no anger
1 some annoyance or irritation at the time, not afterwards
2 thoughts about wanting to do something about it, such as get even, coming into mind for less than 2 days after the event (during the day it happened and the next day)
3 thoughts coming into mind for more than 2 days but less than 7 days after the event
4 angry or annoyed thoughts still coming to mind
5 extremely angry thoughts still coming to mind

(integer)

[ ] **ANGER** Amount of anger relative to injury

Salient focus of anger: You say that you feel angry about it. Can you tell me if the anger that you feel is about having been injured as such or is it more about the consequences of the injury, for example, the effects on your finances, the inconvenience.

ANGFOC (categorical)

[ ] INCID thinks about actual injury / incident
[ ] CONSEQ thinks about consequences of injury / incident consequences
[ ] BOTH thinks about both actual incident and consequences
[ ] SELF
[ ] OTHER
[ ] JOB angry at the job for placing him in that dangerous situation

Injury fear. When people are injured, sometimes they feel quite frightened at the time and they may carry on feeling this way and reflect on the harmful or dangerous situation that they had been in. Can you say if at the time you felt frightened or if you have felt frightened since then when you think about it?
Cross question: How often do you have these thoughts. How difficult is it to get them out of your mind, for example, can you easily just stop thinking these thoughts. Have you have frightening thoughts when you haven't meant to.

0 no fear
1 some fear at the time, not afterwards
2 frightening thoughts coming into mind for less than 2 days after the event (during the day it happened and the next day)
3 frightening thoughts coming into mind for more than 2 days but less than 7 days after the event
4 frightened or fearful thoughts still coming to mind when thinking about it now
5 still feeling extremely frightened when thinking about it now

(integer)

[ ] **FEAR** amount of fear relative to injury

Salient focus of fear. You say that you felt frightened / still feel frightened about it. Can you say what it is that you felt / feel frightened about.

FEARFOC (categorical)

Injury Post Traumatic Stress Disorder. I am going to read out some of the ways that you might have felt since the incident and I would like you to tell me if you have been feeling any of them and , if so, how often.
Cross question: How frequently did you feel like this after your injury. Are you still having this sort of experience.

0 not at all
1 immediately after: during the day it happened and the next day but not afterwards
2 for a week after: for more than two days and less than seven days afterwards
3 continuing: daily since it happened and still experiencing it

[ ] find yourself re-living the incident, like having flashbacks or action replays
[ ] having bad dreams about the incident
[ ] having difficulty with sleep (e.g. wakefulness, difficulty getting to sleep, waking early)
[ ] feeling that you startle more easily than usual
[ ] feeling emotionally distant from people close to you
[ ] feeling disinterested in things that usually interest you
[ ] having trouble concentrating and remembering things
[ ] avoiding situations which remind you of the incident
[ ] being generally irritable for no specific reason
[ ] being generally more wary and suspicious of other people than usual

Injury cause. Who or what do you think caused you to be injured?
Cross question: I am going to ask you whose fault you think that it was in a minute but for now could you just let me know who or what was the cause - in an objective way - of your being injured.

CAUSCAT (categorical)
[ ] SELFC (1) caused entirely by respondent
[ ] SLFPRTC (2) caused partly by respondent, with no mention of anyone else
[ ] EQUALC (3) caused partly by respondent, and equally someone else was partly the cause
[ ] OTHPRTC (4) caused partly by someone else, with no mention of respondent
[ ] OTHERC (5) caused entirely by someone else

[ ] NOCAUS (0) no clear cause ('an accident', 'just one of those things')
[ ] INANIMC (*) an environmental, inanimate cause (the weather, faulty equipment)
** Don't include as integer*
(integer)
[ ] **CAUSE** Cause of injury
Who / what caused injury.
Statement:

Deliberate. Do you think that your injury was caused *deliberately*?

DELIBER (categorical)
[ ] NOTDEL not seen as deliberate
[ ] DELIB seen as deliberate

Injury fault. Now, who's fault do you think it was that you were injured? *(or the fault of what)*
Cross question: You might think that there are things that someone - or you should or should not have done.

FAULTCAT (categorical)

[ ] SELFF (1) entirely respondent's own fault
[ ] SLFPRTF (2) partly respondent's own fault, with no mention of its being anyone else's fault
[ ] EQUALF (3) partly respondent's own fault, but equally it was someone else's fault
[ ] OTHPRTF (4) partly someone else's fault, with no mention of respondent being at fault
[ ] OTHERF (5) entirely someone else's fault

[ ] NOFLT (0) no-one's fault
[ ] INANIMF (*) fault of the environment or something inanimate

* *Do not include as integer*

(integer)

[ ] **FAULT** Injury fault

Who and why at fault for injury. Who was the person at fault and why is that?
Statement:

Moral blame. Do you think that anyone is morally to blame for your being injured (who?).

MORAL (categorical)

[ ] NOTMRL Person not morally to blame
[ ] MORAL Person morally to blame

Legal liability. Do you believe that someone (or organisation) is legally liable for your having been injured?
Statement:

ON DUTY compensation: If there was no automatic criminal injuries compensation scheme in place, do you think that you would apply anyway?

COMPEN (categorical)

[ ] YESCOMP Yes, would apply for compensation
[ ] NO COMP No, would not apply for compensation

Vindication. How important is it, for you, to be compensated for this injury.?

1 extremely important
2 very important
3 not sure
4 not very important
5 not at all important

(integer)

[ ] **VINDIC**

Why compensation important / unimportant. Why do you think that?

OFF DUTY compensation: If there were the possibility of applying for compensation for this injury, do you think that you would apply?

COMPEN (categorical)

[ ] YESCOMP yes, would apply for compensation
[ ] NO COMP no, would not apply for compensation

Vindication. How important would being compensated for this injury be for you?

1 extremely important
2 very important
3 not sure
4 not very important
5 not at all important

(integer)

[ ] **VINDIC**

Why compensation important / unimportant. Why do you think that?

Life Events and Difficulties at Work. I'd like you to think, now, about some of the upsetting events that have happened over this past year, that is since ..... last year, some of the events that you have had to deal with which have changed things for you. First of all, I would like you to think about events that have happened to do with your work. The sorts of event I mean would be a disciplinary inquiry, damaging a police vehicle, having a major argument with a supervisor or being transferred to another division or station without your wanting it. That sort of thing. Over this past year have any of these or anything like this happened to you? I am going to go through a list of the sorts of events that I mean.

WRKEVNT (categorical)

[ ] none
[ ] disciplinary inquiry
[ ] damaging a police vehicle
[ ] having an argument with a supervisor
[ ] being given an unexpected or unwanted transfer
[ ] another on duty injury
[ ] other event

(Go to threat rating for details)

Difficulties at Work. Are there other worries or troubles you have at your work. These may not be sudden events but worries you have had for longer than about three months and about which you think a lot. An example would be a continuing disagreement with a colleague or a supervisor or being required to carry out certain duties which bother you a great deal.

(Go to threat rating for details)

Life Events and Difficulties at Home or Not at Work. Similarly, I would like you to think about any upsetting events that have happened outside of work over this past year. The sorts of event you might find upsetting would be a separation, a death in the family, an illness of a close relative, theft or vandalism - that sort of thing. Over this past year have any of these or anything like this happened to you? Again, I am going to go through a list of the sorts of events that I mean.

HMEVNT (categorical)

[ ] none
[ ] broken a steady relationship or marriage separation
[ ] death of a parent, partner or child
[ ] death of a close relative or close friend
[ ] close relative has or had serious illness or injury
[ ] respondent has or had serious illness
[ ] crisis with housing or accommodation
[ ] theft loss of damage of your property
[ ] fight argument with partner, close friend or other relative
[ ] sudden crisis or major worry about partner, close relative or close friend
[ ] sudden major financial crisis (as distinct from general shortage of money)
[ ] another off duty injury
[ ] other event

(Go to threat rating for details)

Difficulties at Home. Are there other worries or troubles you have at home or outside of work. These may not be sudden events but worries you have had for longer than about three months and about which you think a lot. Examples would be on going worries about your children, problems with your house, trouble with the neighbours or your partner - that sort of thing. **(Go to threat rating for details)**

(Finally, after LE and Difficulties)

Importance of injury compared to all the events that have happened this year. I'd like you to think of any of the setbacks, difficulties and upsets that have happened over this past year - and including this injury - what, if anything would you say was the most upsetting thing that has happened - the one that has upset or disturbed the usual run of things the most.

MOSTSIG (categorical)

[ ] **NOTH** **nothing**

[ ] **INJUR** **the injury**

[ ] **OTHEVNT** **some other event or setback *(specify which one)***

Threat rating for Events and Difficulties

Date: When did this happen: [ ] **PRIOR** Weeks prior

Event: Can you describe for me in some more detail what actually occurred? Would you mind if I just note down some of the things that you are saying? *(if event involves other people check frequency of contact and relationship before event)*

Statement:

Warning: Did you have any warning that this might happen?

WARNEV (categorical)

[ ] NO WRNEV Respondent cannot identify any warning that event was going to occur

[ ] YESWRNEV Respondent can identify some warning that event was going to occur

Independence from own actions: Sometimes we can bring things on ourselves by our own actions. When you think about this ..... do you think you were responsible in some way for causing it? Or perhaps you think that some one else caused it?

[ ] SELFEV (1) caused entirely by respondent

[ ] SLFPRTEV (2) caused partly by respondent, with no mention of anyone else

[ ] EQUALEV (3) caused partly by respondent, and equally someone else was partly the cause

[ ] OTHPRTEV (4) caused partly by someone else, with no mention of respondent

[ ] OTHEREV (5) caused entirely by someone else

[ ] NONEV (0) no clear cause ('just one of those things')

[ ] INAMEV (*) no person caused it (an inanimate cause)

* *Don't include as integer*

Feelings after one week: Can you describe what you were feeling around about one week after this happened?

1 little or none

2 some

3 moderate: decidedly unpleasant or threatening

4 marked: respondent experiences a considerable threat

Long term threat (contextual)

Long term threat (reported)

LOCKERBIE: Were you involved at Lockerbie.

(1) If you were not involved, what do you think about not having gone?

[ ] Mentioned spontaneously as life event

(2) On what dates were you at the site

(3) Specific duties: Specifically what duties did you carry out while there, and how much of your time was spent at each duty (place appropriate number in box beside duty).

[ ]	MORTUARY	mortuary
[ ]	SEARCH	search for productions
[ ]	PATROL	road patrol, traffic control, motor cycle escort, security patrol
[ ]	PUBLIC	official dealings with relatives and other members of the public
[ ]	ADMIN	administration
[ ]	OTHER	specify

1	very short time (up to a quarter of the total time)	[combined with '3']
2	half total time	
3	most of the total time, over half to three quarters of total time (e.g. 9 hours of a 12 hour shift)	[combined with '1']
4	all of total time	

(4) Did the experience upset you in any way at the time or do you feel that you coped well?

(5) What do you think helped you?

(6) Do you still think at all about the incident *(if appropriate)* PTSS questions

(7) Do you think differently about your work as a police officer or do you think that you are carrying out your work any differently? Do you think that it has, in any way had an effect on relations at work?

(8) Do you think that it has had any effect on life at home?

(9) Are you aware of any continuing physical complaints which you attribute to working at the site?

Cross questions: Medical services which should have been provided at the time or now. Do people at work still talk about it

Accident Circumstances First Study.

3.

I lowered myself from a 1st floor window, not realising the height involved - found I could not get back in and had to drop down.

6.

I was rushing out the back door of my house when I tripped on the stairs.

7.

Arrested one man put him in the car, he kicked me and pushed my arm into the hinge of the door then shut door on elbow and broke it.

8.

21.55 hours (dark) walking along footpath and for no apparent reason I went over on my ankle.

10.

Called to a disturbance at a shopping arcade. On arrival 3 youths began fighting next to police car. On attempting to apprehend one fight ensued. This male twisted my right arm dislocating it from right shoulder socket. Males apprehended.

11.

On making the arrest of the accused, the accused shouted for his dog to be let out of the house. On seeing the ensuing struggle between myself and its owner the dog bit myself first on the upper leg and then again on the lower leg.

12.

Tripped and fell downstairs when leaving daughters wedding reception. result - broken wrist.

13.

While apprehending a housebreaker, both of us fell down a flight of stairs on grabbing his left leg he kicked my hand in an effort to break free as a result two fingers were broken.

14.

Whilst playing football I jumped up to head the ball when I landed I went over on my right ankle.

16.

Whilst playing rugby at Lochinch park Glasgow I was tackled from behind and fell to the ground injuring my ankle.

17.

Arresting person on warrant when kicked on hand causing broken finger and head butted in face causing bruising.

18.

I was checking the roof of a premises broken into I was climbing a set of ladders when they slipped away and as I fell I grabbed the roof of the building to stop falling.

20.

Attended the call of a house being broken into. On arrival could hear intruders at the rear of the house. I ran along the top of a brick wall 4' high saw intruders leaving via broken window I then was about to jump from the wall to apprehend when I slipped and fell half straddling the wall. As a result of the fall I sustained injury to my right leg and forearm and to the inside of my left thigh. The intruders made good their escape.

25.

It happened during recreation period at the police college when our group were in the gym playing football when an instructor came down on my ankle accidentally breaking the fibula.

26.

I was standing by the scene of a housebreaking when the perpetrator came running out of the house and threw me to the ground.

27.

The injury happened during basketball training. I have damaged the muscles in my upper left arm.

31.

Struggling with prisoner (male) who kicked me on right hand dislocating right thumb.

34.

During the course of a police football match, I collected the ball with my back to an opponent. I then turned to my right at the same time as the opponent slid in and caught my right ankle. I twisted and fell thus causing the injury.

35.

During a mock demonstration at Oxford Street Training School I was knocked to the ground and subsequently broke my wrist.

36.

My younger brother and I were carrying on within out house I then stumbled and fell through a glass door.

38.

Playing football lost balance and as I went on to my right ankle was kicked causing ankle to swell.

40.

Skiing at Edinburgh lost balance and injured right elbow.

41.

Injury occurred whilst playing 5 a side football I put in a strong tackle whilst off balance which caused the dislocation of my right knee.

42.

Making a tackle whilst playing rugby for my local rugby club.

44.

Chasing a suspect and fell on ice.

45.

Chasing a suspect from a housebreaking. Suspect was carrying a metal bar and turned on me and struck me with bar.

46.

I had arrested a man on warrant when I was surrounded by an angry violent crowd. Assistance was summoned but took too long to arrive. Myself and the 3 other officers could have been more seriously injured During this time I was kicked in the hand.

47.

I slipped on a slope which was mossy and frosty. I fell across a small wall landing on my arm, breaking it.

49.

Walking across roadway outside Malaga airport to bus park and put foot into hole in roadway.

50.

On duty at football when arresting a drunken male he pushed me back against an iron door fracturing a bone in my hand.

51.

Road accident at cross roads. My vehicle crossing junction when hit side on by other obviously travelling too fast. With force of impact, my vehicle thrown across road and knocked down a pedestrian crossing other part of road.

52.

Walking on wet road surface when I slipped and fell, put out left hand to break fall and fell awkwardly breaking left wrist.

53.

Fell whilst skiing on a dry ski slope. Caught right thumb in matting fracturing same.

54.

I was alighting from a police vehicle and had one leg out of the door - this foot slipped on a patch of ice and buckled under me and I fell twisting my knee.

56.

At Great Western Road at Cromwell Street. Parked car in car park , barrier about 18" high between car park and street. I jumped over barrier lost balance and fell.

57.

I was driving a police vehicle when a prisoner in the rear seat kicked me on the left shoulder causing me to lose control of the vehicle. The kick aggravated an old injury causing persistent pain.

58.

I was chasing 4 people who had been in a stolen car. As I reached forward to catch hold of one youth he turned and hit me in the face with a bag containing tools I over balanced but managed to grab hold of him. Both of us fell to the ground in the fall I fractured several bones in my hand.

61.

Report of disturbance with weapons (hatchet and knives). Went to disturbance. Fight in house with mother and son. Son assaulted me, resisted arrest and breach of the peace. Mother also assaulted my partner. Injury - scaphoid fracture of the right wrist.

62.

fracture to scaphoid right hand following a tackle during a game of football.

63.

I was entering to police vehicle and closed the door over the ring finger of my right hand lacerating it.

64.

Whilst trying to apprehend two housebreakers I twisted my ankle running towards them and broke a bone in my right foot.

66.

In the process of arresting the driver of a motor vehicle who had refused a breath test when six of his friends obtained his release by assaulting me and my colleague.

69.

I have an Achilles tendon injury to my right ankle. I was painting in the kitchen and tore the tendon when I overstretched on the ladder.

70.

Removing hard packed ice whilst defrosting freezer. Hand slipped along sharp household knife which I was using to loosen ice. Injury to finger.

71.

During work went to disturbance. On arrival saw man weilding stick. Challenged man to drop stick but he attempted to strike me on head with it. I put up my arm to defend myself and was struck on the hand with the weapon which was found to be a metal bar.

72.

Standing on chair in kitchen at home mid afternoon. Several jars and cans fell off top shelf. Jar shattered on table just as my hand came down on it. I lost balance trying to catch items and jumped to floor at the same time, I think, steadying myself on the table.

74.

Wearing new shoes I slipped and fell downstairs.

76.

While arresting a drunk man after an incident I was involved in a struggle. Once at the hospital I fainted. About an hour after, returning the man to the police office I became aware of a severe pain on my wrist.

79.

Whilst on duty arresting a person he began to struggle violently. I was kicked, head butted and spat on. During the course of the struggle, I was kicked on the hand and sustained a fracture to a bone in my right hand.

80.

Injury happened off duty. I was playing basket ball and landed on an opponent's foot thus going over on my left ankle.

82.

Off duty in 5 a side football, turned my ankle and heard a crack. Lump formed on my foot and I ended up with a transverse fracture of the 5th metatarsal.

83.

Off duty. I was curling and I bent down to play a stone and I tore my medial cartilage in my right knee.

84.

I arrived home about 11 p.m., from a social evening having gone off duty at 5 p.m. the same day. I approached my house by the rear gate and began to ascend a flight of six concrete steps. Unfortunately I slipped off the first step and fell heavily, striking my upper right arm on the top step.

85.

Off duty. Road accident, motor cycle no other vehicle or person involved.

87.

On duty. Arresting a male for theft from a motor vehicle in Lane. He struggled very violently and in an attempt to restrain him we both fell to the ground and I fractured my right ankle.

88.

While on duty, following a vehicle pursuit with a stolen car, I gave chase to and arrested one of the passengers after a bail out. This person began struggling with me and both of us fell to the ground. As I fell I landed on my arm and broke it.

89.

Damaged shoulder muscles handling motor cycle at work.

90.

I was driving my motor car off duty and was involved in a road accident.

93.

On duty, along with a colleague I was attempting to detain a suspect for robbery and was being physically obstructed by two other adult males within the house when I had two rottweiler dogs set on me.

94.

Injury on duty, chasing youths about to grab hold of one when I lost my footing on ice and snow underfoot, slipped forward and ended up going over a small wall which had a drop of approximately 15' to a tarmacadam surface below where I landed.

96.

On duty, pursuing a person from a stolen vehicle I climbed over a few fences and then fell off a small wall injuring my left foot.

97.

Walking the dog whilst off duty and fell on uneven path.

98.

On duty, chasing after a shoplifter who shut a door on my right hand.

99.

On duty, I was directing the driver of the horse box back out of the police garage, I signalled to him to stop, he failed to do so, I stepped forward to hit the side of the box and got my leg trapped between the horse box and a parked car.

102.

On duty, hurt in minor road accident during the arrest of two youths in a stolen vehicle.

103.

Off duty, fitting smoke alarm at top of stairway - standing on a stool - two legs of stool near edge of top step - on climbing on to stool legs slipped over step causing me to fall on to top landing bending my left arm and hand under my body (broken wrist in 2 places and 3 broken fingers.

104.

While working in July I arrested a man and when placing him in the rear of the police vehicle he began to struggle and as a result my wrist got wedged between the side of the van and the rear door. Whereupon the door was shut over by the man and it broke my wrist and hand bones. March I tore the tendons on my right wrist same one as I broke.

105.

While attending a complaint at a house I was attacked by one of the occupants of the house without any warning.

106.

Playing indoor football within local sports centre when I went over on my right ankle, and as a result have torn and strained the ligaments in my right foot and ankle.

107.

Jogging off duty.

111.

Off duty playing football fell on my knee did not hurt at the time, later that day knee began swelling and pain became severe.

113.

On duty, chasing a housebreaker, evening, along ill defined footpath on rough ground. Fell over strand of wire from derelict fence, whilst running, struck shoulder on rock upon landing.

116.

Off duty playing football for police team. Damaged ligaments in right ankle during a tackle.

117.

On duty attempting to apprehend person on breach of the peace. Assaulted by accused wielding a piece of wood. Blow aimed for my forehead. Warded off by raising my arm. Hand and wrist injured.

119.

Whilst on duty successfully stopped a youth from committing suicide. He was attempting to jump into the River . . . . . and struggled violently.

120.

On duty, detaining a suspect who broke away from the grasp of my colleague and myself. He ran to glass panelled door which he took hold of and swung at me as I gave chase to him. I put my right hand up to prevent the door striking me on the face and my hand smashed through the glass.

123.

Playing football off duty and during the game twisted my ankle in a rut in the park.

124.

While coming down a ladder off duty it slipped and I had to jump clear. On landing I went over on my ankle and injured same.

125.

Stumbled while playing football off duty.

127.

Playing football whilst off duty. Member of opposing team stood on foot and as I fell over bone broke in foot.

128.

Running into house off duty and left foot caught on step.

129.

While chasing a group of 10-12 youths who had just committed an assault, I caught one and then overstretched to take hold of a second and twisted my right knee.

DIAGNOSIS

Section A: Fracture or Dislocation
(n.b. ask for permission to send medical information release slip with questionnaire)
Site:

Fracture [] Dislocation [] Simple [] Compound []
Reduction: closed [] open []
Anaesthetic local [] general []
Immobilisation: dressings [] internal [] POP [] traction []
Complications
(e.g. nerves and tendons):

FOR EFFECT ON ADJACENT JOINT COMPLETE SECTION D

Section B: Soft tissue injury
Site:

Bruising: under 4 inches diameter [] over 4 inches diameter []
Swelling (compared with same site on unaffected limb):
under half an inch of difference [] over half an inch to 2 inches [] over 2 inches []
Open wound: stab [] incision [] laceration [] abrasion []
cleaned & dressed [] sutured [] other surgical intervention:
Complications (e.g. nerves and tendons):

FOR EFFECT ON ADJACENT JOINT COMPLETE SECTION D

Section C: Sprain and ligament injury
Site:

Range of movement (including pronation/supination):
up to 25% impairment [] approx half normal range [] severe impairment []
Swelling (compared with same site on unaffected limb):
under half an inch of difference [] over half an inch to 2 inches [] over 2 inches []
Muscle power: minor impairment [] approx half strength [] severe impairment []
Weight bearing (lower limb): normal [] with difficulty [] not able to []

Section D: Joint impairment

Shoulder Elbow Wrist Hands/Fingers

Hip Knee Ankle Subtalar Toes/Metarsals

Range of movement (including pronation/supination):

minimal impairment [] approx half capacity [] severe impairment []

Muscle power: minor impairment [] approx half capacity [] severe impairment []

Weight bearing (lower limb): normal [] with difficulty [] not able to []

Patient's height:

Patient's weight:

Other treatment/advice/recommendations:

Patient's understanding of diagnosis and instructions: good [] poor []

Comments

"Thank you very much for taking part in this study of injuries. This research has nothing to do with your employment and is being carried out independently from the medical department. All the information that you give is completely confidential and is not seem by your employer or reported to them. I am a casualty sister and my part in the research is to find out what you have actually injured."

Subject name : Subject number :
Job title / rank :
Division / Station:

Date of Injury :
Date of Examination : Number of days since injury :

On duty / Off duty
Examiner's rating of visibility of injury (e.g.pronounced limp, crutches, plaster) yes / no

Before I start the actual examination there are a number of questions I would like to ask you. First of all could you tell me, please, what you think you have done to yourself?

Thinking about this injury yourself would you say it is moderate, or minor or severe?
minor [] moderate [] severe []
Why do you think that?

When you are interviewed or fill out the questionnaire for the psychologist you will be asked to describe in detail how the incident happened, but for now, could you say if you were hit with something or if you fell or what?

Did you attend hospital?

None	[]
Gartnavel	[]
Royal Infirmary	[]
Stobhill	[]
Victoria	[]
Western	[]
Southern General	[]

Did you attend a clinic :

Accident and Emergency	[]
A & E clinic	[]
Fracture clinic	[]
X-ray	[]

Other clinic/ward:
Initial treatment given or suggested?: *(physiotherapy, rest, active or passive approach)*

Follow up care: *(physiotherapy, rest, active or passive approach)*

*(if appropriate)*Did you stay over night at hospital? yes / no
Number of nights: Reason:

May I ask the name and address of your family doctor?

Examiner: rate the subject's understanding of diagnosis
good [] poor [] muddled []

I have a list of ratings here about normal day to day activities. I am trying to find out how you manage them. If you haven't tried the activity I ask you about, I would like to know if you think you could do it. So, thinking about at present - today **Codes:** 0 = no problem; 1 = some pain and restriction makes it difficult or slower ; 2 = can't at all or practically impossible

Can you.....

sit for over an hour without discomfort?	0 1 2
stand for more than an hour?	0 1 2
walk a quarter mile?	0 1 2
climb stairs?	0 1 2
climb ladders?	0 1 2
run a short distance?	0 1 2
pedal a bicycle?	0 1 2
bend down to the floor to pick up something while standing?	0 1 2
twist around to get something behind you?	0 1 2
kneel on the floor?	0 1 2
squat on the floor to get at a low cupboard?	0 1 2

left / right dominant

push a hoover or a supermarket trolley?

RH	0 1 2
LH	0 1 2
Both	0 1 2

pull something like a dog on a leash?

RH	0 1 2
LH	0 1 2
Both	0 1 2

reach up to a top shelf above your head?

RH	0 1 2
LH	0 1 2
Both	0 1 2

pinch grip/manipulate things like kitchen utensils or pens?

RH	0 1 2
LH	0 1 2
Both	0 1 2

lift an object such as a kitchen chair?

RH	0 1 2
LH	0 1 2
Both	0 1 2

carry something heavy across a room?

RH	0 1 2
LH	0 1 2
Both	0 1 2
drive?	o0 1 2
bathe ?	0 1 2

Are there any activities for which you need help?

What is it that restricts these activities for you. for example, is it pain or awkwardness with your plaster?

pain []
awkwardness []
protecting yourself []
other :

"In your normal work as a police officer, can you tell me, please, what percentage of your working time is spent on the following activities? You don't need to be completely accurate, of course, but just approximately relative to each activity"

(within 10%)

standing

walking on pavement

walking on rough ground

climbing stairs

driving a car

driving a motor cycle

sitting doing paperwork

dealing with violent / drunk people

Any comments on other activities done quite a lot, occasional relief work or general comments on the physical demands of the job:

[Examiner: mark X activities which subject thinks would be very difficult or impossible just now]

Up until you had your injury, did you manage all the physical aspects of your work?

no problems at all []
some minor problems *(which)* []
not managing well at all *(why)* []

JOINT IMPAIRMENT
(circle which joint affected)

Facial
Shoulder
Elbow
Wrist
Hands / Fingers
Hip
Knee
Ankle
Subtalar
Foot / Toes

Restriction in ROM of main joint involved
(0%) []
1% - 33% []
34% - 66% []
67% - 100% []

Muscle power
(Oxford Scale)
0 = nil
1 = flicker of contraction only
2 = weak: contraction / movement with gravity counterbalanced
3 = fair: contraction / movement against gravity
4 = good: against gravity and some resistance
5 = normal

Weight bearing
(upper or lower limb)
full []
partial []
none []

Other secondary joints involved:
minimal []
moderate []
major []

Muscle wasting:
none []
minor []
moderate []
major []

SUMMARY *(after examination completed)*

Diagnosis of site and type of injury:

(Oxford Road Traffic Accident Survey codes)

Site code :

Structure code :

Bone and joint trauma type code :

Soft tissue trauma type code :

(ICD, AIS & ISS classification codes)

ICD code :

AIS code :

ISS code :

ICD E-code

Examiner's prediction of period of absence from work :

SPRAIN and / or LIGAMENT DAMAGE

Site

Restriction of range of movement:
(0%) []
1% - 33% []
34% - 66% []
67% - 100% []

Swelling
(compared with same site on unaffected limb)
0% - 25% []
26% - 50% []
51% - 75% []
76% - 100% []

Muscle power
(Oxford Scale)
0 = nil
1 = flicker of contraction only
2 = weak: contraction / movement with gravity counterbalanced
3 = fair: contraction / movement against gravity
4 = good: against gravity and some resistance
5 = normal

Weight bearing
(upper or lower limb):
full []
partial []
none []

Bruising
negligible []
pronounced []
extent: *(expressed in inches diameter)*:

Colouring
increased []
normal []
paler []

Muscle wasting
(compared with same site on unaffected limb)
0% - 25% []
26% - 50% []
51% - 75% []
76% - 100% []

Complications *(e.g. nerves, tendons, circulation)*

SOFT TISSUE INJURY

Site:

Open wound
Stab []
Incision []
Laceration []
Abrasion []

Blow []

Bruising
negligible []
pronounced []
extent: *(expressed in inches diameter)*:

Swelling
(compared with same site on unaffected limb)
0% - 25% []
26% - 50% []
51% - 75% []
76% - 100% []
Treatment:
cleaned & dressed []
sutured []
Any other surgical procedure?

Current status of wound
healing []
Complications *(e.g. infection)*

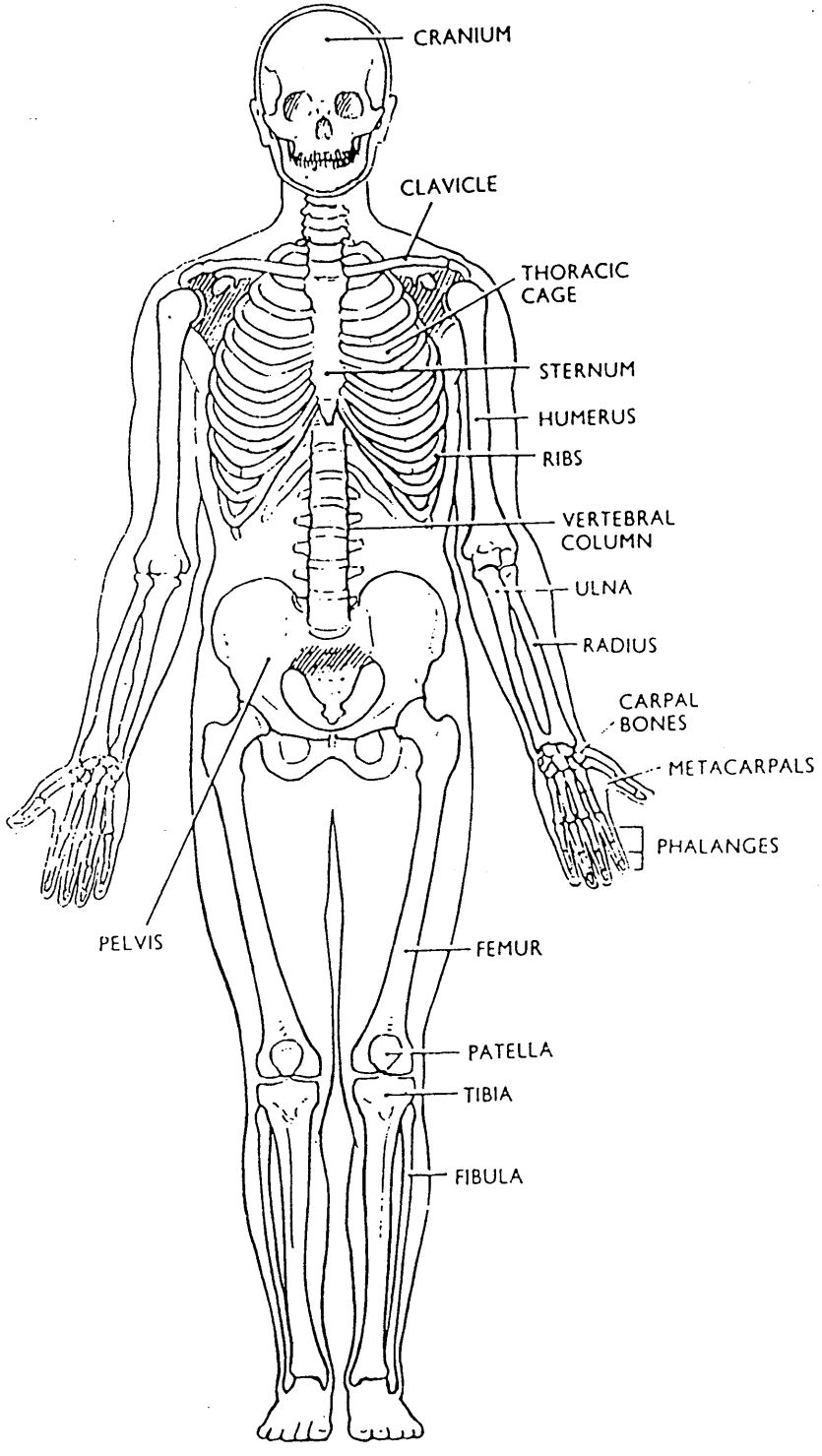
Temperature of site
hot []
normal []
colder []

Colouring
increased []
normal []
paler []
Muscle wasting
(compared with same site on unaffected limb)
0% - 25% []
26% - 50% []
51% - 75% []
76% - 100% []

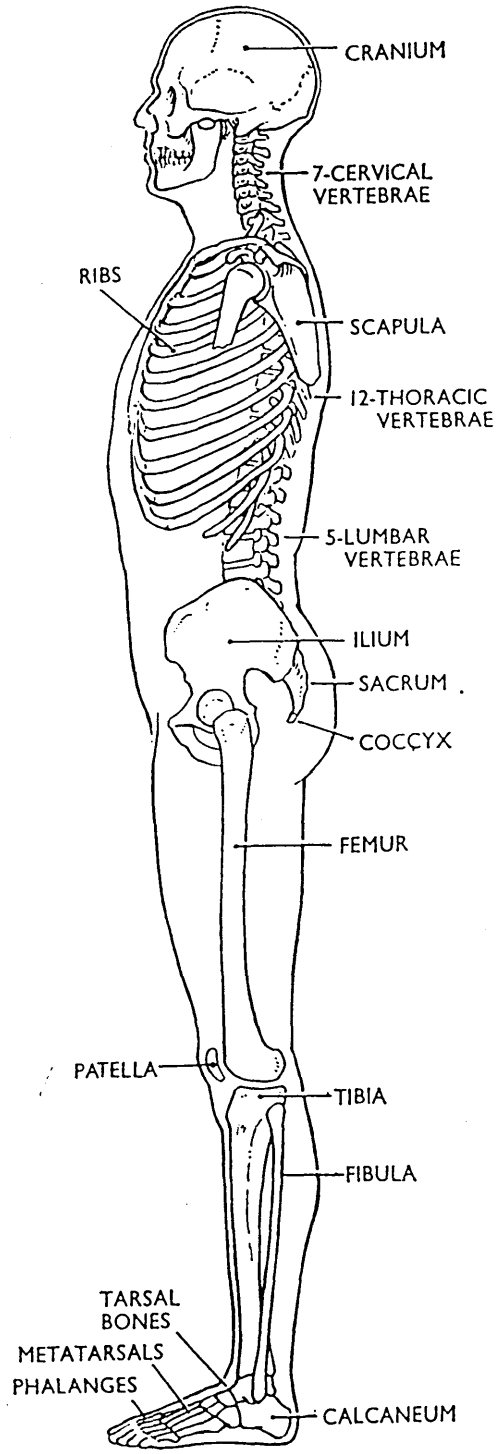
Complications: *(e.g. nerves, tendons, circulation)*

L

THE SKELETON



The skeleton
(*a*) Anterior view



The skeleton
(*b*) Lateral view

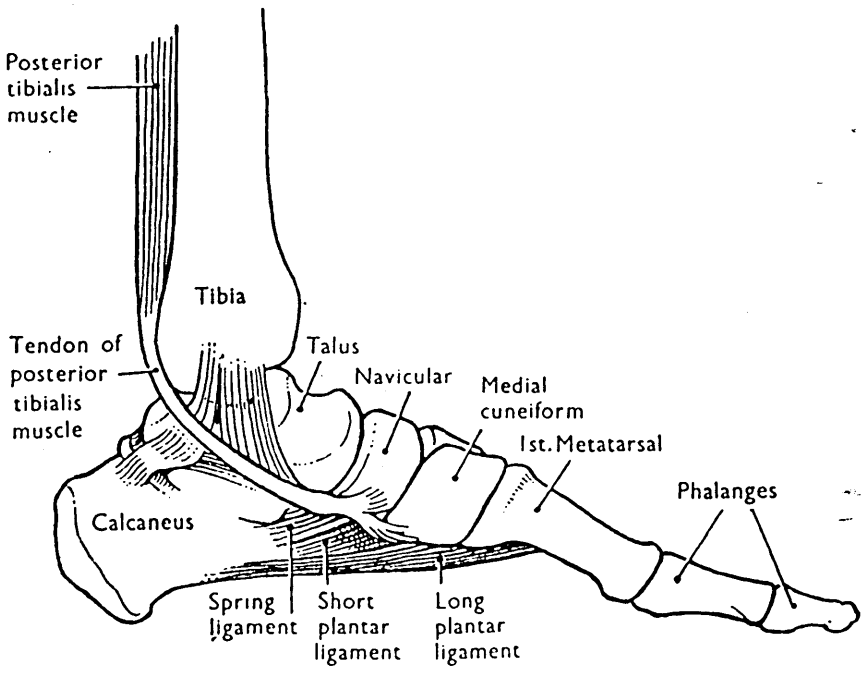
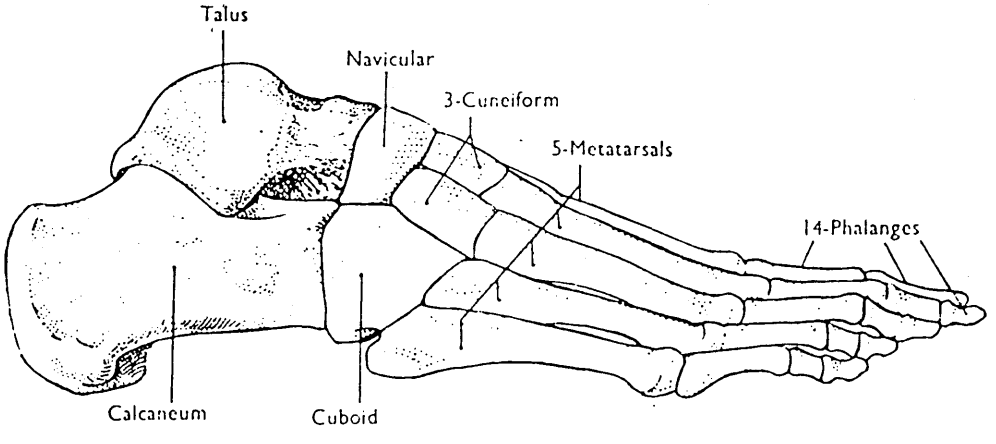
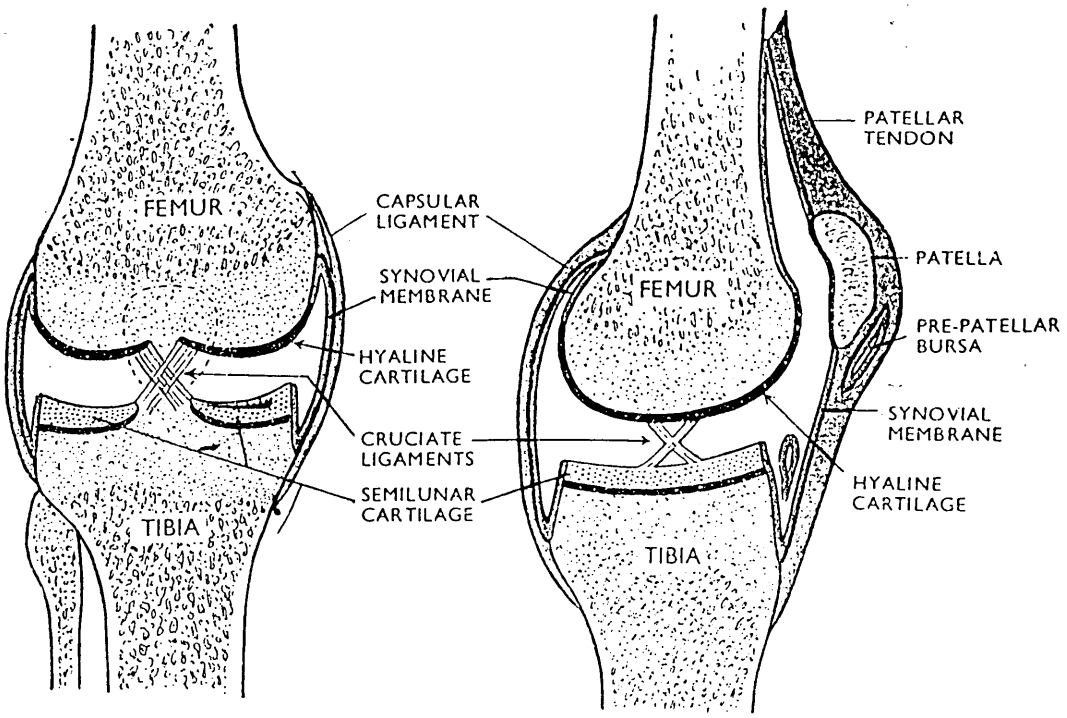


Diagram illustrating the ligaments which help to support the arches of the foot



The bones of the foot

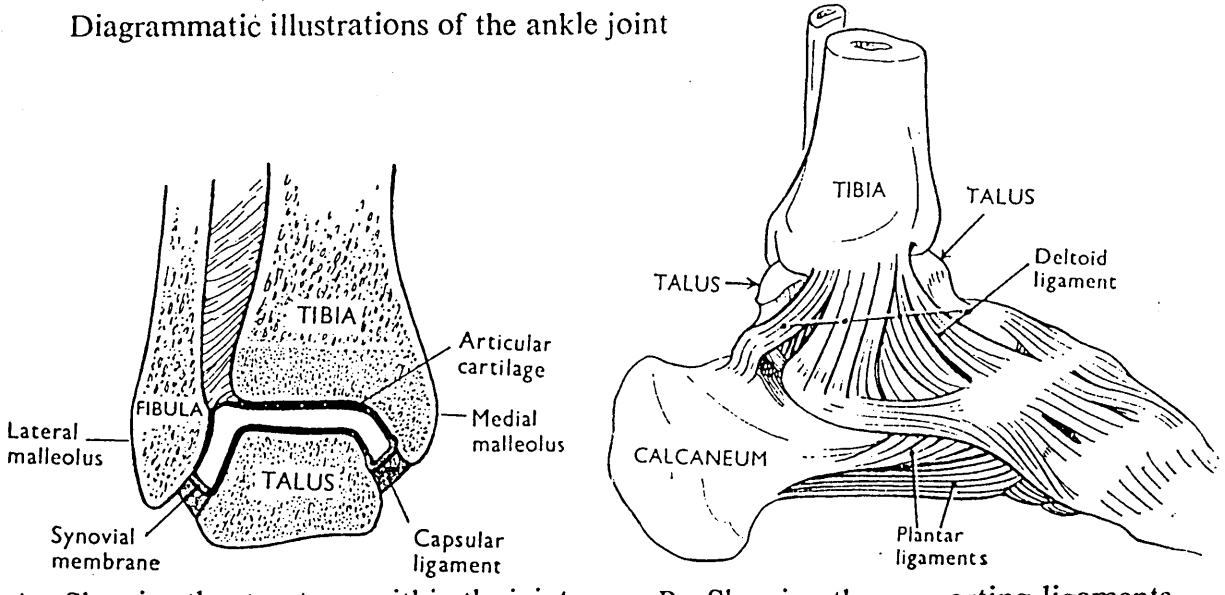
Diagrammatic illustrations of the knee joint



A—Anterior view showing the intracapsular structures

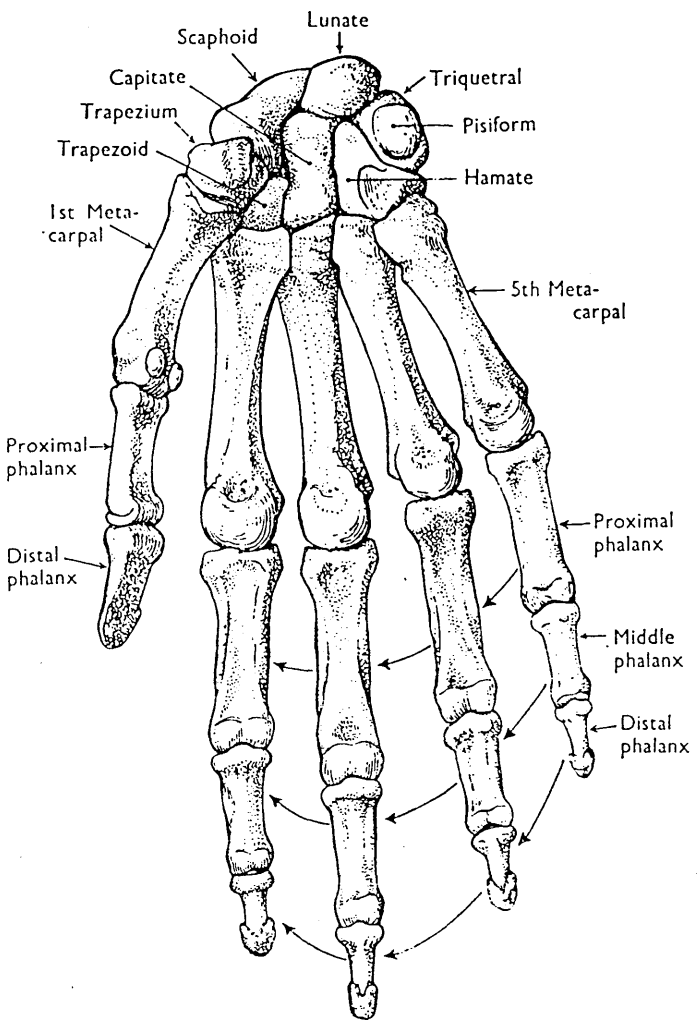
B—Lateral view showing the position of the patella

Diagrammatic illustrations of the ankle joint

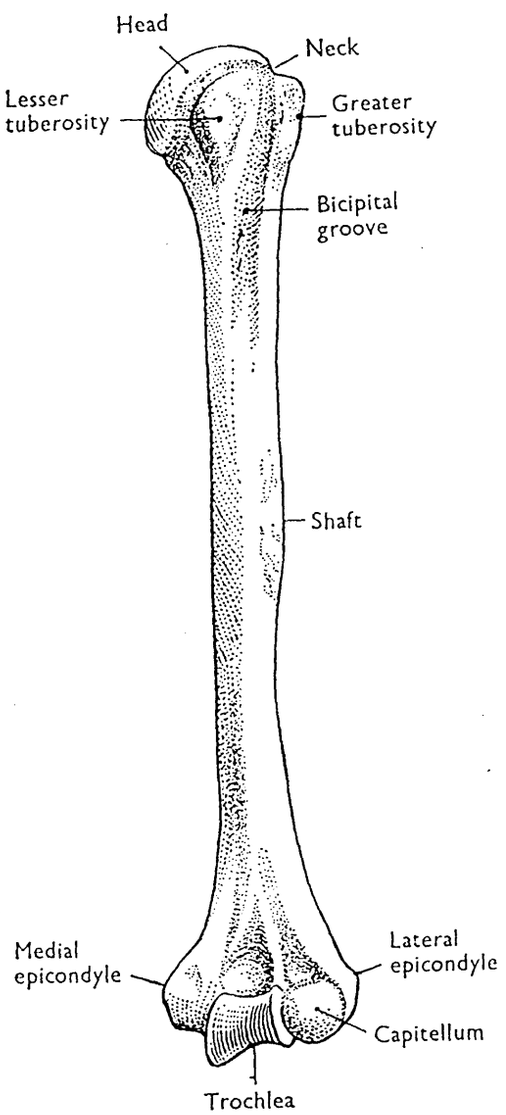


A—Showing the structures within the joint

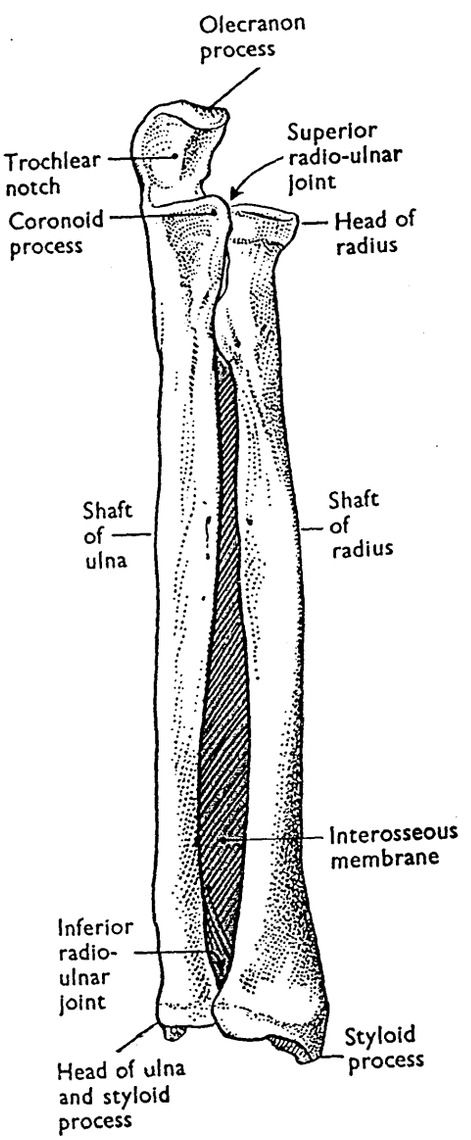
B—Showing the supporting ligaments



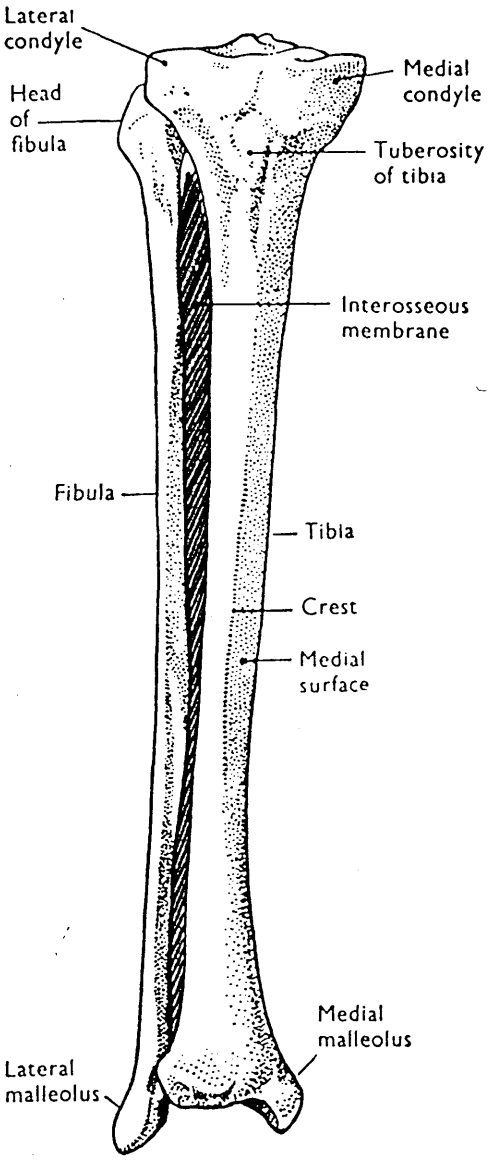
The bones of the wrist, hand and fingers



The humerus



The radius and ulna joined by the interosseous membrane



The tibia and fibula showing the interosseous membrane

Correlation matrix all variables first prospective study

Correlation Matrix for Variables: X_1 ... X_{14}

	Illness h...	Injury hi...	Depressi...	Anxiety	GHQ 12	Life eve...	Work so...	Work sa...
Illness hi...	1							
Injury hi...	.124	1						
Depression	.025	.002	1					
Anxiety	-.091	.002	.668	1				
GHQ 12	.031	.076	.45	.514	1			
Life events	.055	.102	.267	.235	.3	1		
Work soc...	-.128	-.171	-.108	-.084	.116	-.126	1	
Work sati...	.066	-.01	-.1	-.214	-.292	-.137	-.019	1
Service	.234	-.09	.012	.049	-.015	-.187	-.008	.054
Culpability	-.125	-.152	.139	.027	-.014	-.017	-.004	-.125
Causal re...	-.255	.001	.083	.041	.033	.02	-.109	-.025
Mean esti...	-.025	.098	.26	.167	.111	.206	.025	.233
LOA	.239	.01	-.03	.092	.09	.237	.182	.194
ARR	.326	-.113	-.15	-.006	.002	.122	.063	-.05

Correlation Matrix for Variables: X_1 ... X_{14}

	Service	Culpabili...	Causal r...	Mean es...	LOA	ARR
Service	1					
Culpability	.108	1				
Causal respo...	-.018	.72	1			
Mean estima...	.001	-.023	.009	1		
LOA	-.049	-.067	.013	.51	1	
ARR	-.025	-.049	-.009	-.398	.462	1

Intercorrelation of medical adjudicators estimates and LOA

Correlation Matrix for Variables: X_1 ... X_{10}

	Adj 1	Adj 2	Adj 3	Adj 4	Adj 5	Adj 6	Adj 7	Adj 8
Adj 1	1							
Adj 2	.623	1						
Adj 3	.523	.658	1					
Adj 4	.538	.542	.482	1				
Adj 5	.451	.519	.559	.719	1			
Adj 6	.597	.71	.691	.687	.643	1		
Adj 7	.543	.747	.68	.588	.59	.773	1	
Adj 8	.58	.653	.758	.612	.677	.727	.737	1
Adj 9	.536	.624	.672	.539	.689	.712	.724	.85
LOA	.201	.362	.384	.488	.436	.4	.38	.408

Correlation Matrix for Variables: X_1 ... X_{10}

	Adj 9	LOA
Adj 9	1	
LOA	.416	1

Appendix O: Correlation matrix all medical adjudicators

	Adj 1	Adj 2	Adj 3	Adj 4	Adj 5	Adj 6	Adj 7	Adj 8
Adj 1	1							
Adj 2	.673	1						
Adj 3	.718	.711	1					
Adj 4	.666	.745	.7	1				
Adj 5	.477	.641	.498	.598	1			
Adj 6	.553	.556	.424	.467	.505	1		
Adj 7	.562	.64	.629	.713	.588	.553	1	
Adj 8	.5	.461	.495	.517	.442	.739	.723	1
Adj 9	.63	.469	.414	.333	.338	.218	.296	.241
Adj 10	.681	.613	.796	.763	.403	.374	.626	.494
Adj 11	.69	.647	.708	.722	.577	.346	.421	.364
Adj 12	.63	.747	.723	.73	.556	.367	.491	.404
Adj 13	.448	.61	.512	.517	.448	.254	.429	.274
Adj 14	.464	.319	.569	.415	.167	.322	.426	.299
LOA	.201	.161	.246	.368	.141	.354	.183	.515

	Adj 9	Adj 10	Adj 11	Adj 12	Adj 13	Adj 14	LOA
Adj 9	1						
Adj 10	.234	1					
Adj 11	.456	.644	1				
Adj 12	.52	.638	.767	1			
Adj 13	.36	.518	.519	.583	1		
Adj 14	.321	.496	.361	.353	.082	1	
LOA	.083	.271	.289	.222	.134	.148	1

	ID	Injury	Adj 1
1	3	Fx os calcis; Contusion to back	10
2	6	Fx shaft 5th metatarsal	4
3	7	Chip Fx left olecranon	4
4	8	Sprain ligaments ankle; Stretched Achilles tendon	2
5	10	Dislocation right shoulder	6
6	11	3 deep lacerations thigh and lower leg	4
7	12	Fx right radius	6
8	13	Fx 4th right distal phalanx; Compound Fx right 5th shaft	8
9	14	Sprained ligaments ankle	3
10	16	Sprained ligaments ankle	2
11	17	Fx right phalanx; Damaged flexor tendon	4
12	18	Torn ligaments left shoulder	12
13	20	Abrasion, bruising leg and arm	2
14	25	First degree Pott's Fx of fibula	4
15	26	Fx right index and middle fingers	4
16	27	Muscle strain upper left arm	6
17	31	Dislocation right thumb; Stretched tendons	6
18	34	Medial ligament sprain; Damaged cartilage; Bone particle knee	8
19	35	Fx right scaphoid	6
20	36	Lacerations upper right arm	4
21	38	Sprained ligaments ankle	4
22	40	Torn ligaments left elbow	6
23	41	Closed dislocation patella	6
24	42	Open Bennett's fracture left thumb	6
25	44	Fx 5th phalanx foot; Sprained ankle ligaments	4
26	45	Bruised knee	1
27	46	Fx right 5th metacarpal	4
28	47	Fx mid shaft humerus	6
29	49	Fx 2nd and 3rd metatarsals	4
30	50	Fx 5th metacarpal	4
31	51	Knee, chest contusion	1
32	52	Fx left scaphoid	6
33	53	Fx right thumb	6
34	54	Sprain medial ligament of knee; Inflammation cartilage	4
35	56	Sprained ligaments left wrist	2
36	57	Inflammation articular surface of shoulder joint	3
37	58	Fx left MP joint thumb, shaft proximal phalanx, terminal phalanx	8
38	61	Fx right scaphoid	6
39	62	Bennett's Fx right MCP joint	6
40	63	Laceration right ring finger; Flake Fx distal phalanx	2
41	64	Fx right lateral malleolus	4
42	66	Fx right metacarpal	4
43	69	Strain Achilles tendon	2
44	70	Severed flexor tendon right 5th finger	4
45	71	Chip Fx trapezium right wrist	4
46	72	Laceration right palm	4
47	74	Sprained ligaments ankle	2
48	76	Fx left scaphoid	6
49	79	Fx right 5th metacarpal	4
50	80	Sprained ligaments ankle	2
51	82	Transverse Fx 5th metatarsal	4
52	83	Torn meniscus; Cartilage strain medial aspect knee	8
53	84	Fx right humerus	6

	ID	Injury	Adj 1
54	85	Fx right scaphoid; Ligament tendon strain of ankle	6
55	87	Fx lateral malleolus	4
56	88	Fx right humerus; Fx right radius	8
57	89	Sprain shoulder and scapula (progressive osteoarthritis)	6
58	90	Fx left wrist; Fx sternum	4
59	93	Crush Fx left proximal phalanx	6
60	94	Dislocation knee and strained muscles	6
61	96	Strained ligament in anterior area of ankle; Tenosynovitis	4
62	97	Torn ligament in ankle	8
63	98	Fx right 3rd metacarpal	4
64	99	Abrasion to thigh	2
65	102	Ligament strain to right thumb and wrist	4
66	103	Fx 3rd, 4th, 5th proximal phalanges; Fx trapezium; Fx capitate	8
67	104	Ligament sprain right thumb (de Quervain's syndrome)	8
68	105	Fx left scaphoid	6
69	106	Torn ligaments ankle	8
70	107	Strained ligaments knee	6
71	111	Strained knee at popliteal space	6
72	113	Strained acromio-clavicular joint right shoulder	4
73	116	Torn ligaments ankle (superimposed on previous strain)	8
74	117	Fx right scaphoid	6
75	119	Fx left 5th distal phalanx; strained wrist	3
76	120	Laceration base right thumb, 5th finger; Tendon damage; Ulnar nerve division	10
77	123	Sprained ligaments ankle (superimposed previous RTA injury)	4
78	124	Flake Fx lateral malleolus; Torn ligaments ankle	8
79	125	Fx left scaphoid	6
80	127	Fx 4th, 5th metacarpals; Sprained ligaments ankle	4
81	128	Fx base 5th metatarsal	4
82	129	Sprain knee	2

	Adj 2	Adj 3	Adj 4	Adj 5	Adj 6	Adj 7	Adj 8	Adj 9
1	14	16	11	14	20	24	14	12
2	4	4	3	2	9	10	6	6
3	3	6	10	10	9	8	9	8
4	5	3	12	10	8	8	5	6
5	8	6	4	3	12	10	4	6
6	2	3	7	4	5	6	4	6
7	6	6	9	6	9	8	8	8
8	6	5	4	4	8	8	12	8
9	2	3	6	9	8	8	4	6
10	1	2	2	2	8	8	4	6
11	5	4	2	12	5	8	4	8
12	8	6	14	16	14	10	8	8
13	1	1	3	3	6	6	3	4
14	6	6	8	14	10	12	10	8
15	5	3	4	3	7	6	6	6
16	2	1	2	1	4	6	3	4
17	6	2	8	4	10	10	4	6
18	5	6	20	14	12	14	12	8
19	8	8	12	12	12	16	12	12
20	3	4	4	8	6	6	3	8
21	4	2	7	8	9	10	4	4
22	8	4	4	5	7	8	6	6
23	2	3	3	4	9	12	6	8
24	12	4	10	4	10	14	8	8
25	3	3	4	8	9	8	6	6
26	1	2	3	2	5	4	2	4
27	3	4	5	3	7	6	6	6
28	4	6	12	12	15	12	12	12
29	4	6	3	3	10	6	6	6
30	3	4	5	2	9	6	4	6
31	1	1	2	4	8	6	4	6
32	8	6	10	16	12	14	12	12
33	8	4	5	3	10	12	6	6
34	4	3	12	11	8	10	6	6
35	4	2	2	2	8	6	4	4
36	2	2	10	14	10	8	6	6
37	12	4	7	6	9	14	12	8
38	8	6	11	14	12	16	12	12
39	12	5	6	4	11	14	6	6
40	1	2	2	2	7	6	4	6
41	6	5	6	12	10	12	10	10
42	4	4	2	3	7	6	6	6
43	3	4	9	5	6	6	4	6
44	3	5	10	6	14	14	10	8
45	5	4	4	7	10	12	6	8
46	2	2	3	4	5	14	3	6
47	4	2	4	3	8	8	4	6
48	8	6	12	12	12	14	12	12
49	3	3	2	3	7	6	6	6
50	3	2	5	6	8	8	4	6
51	3	4	4	4	8	8	6	6
52	12	6	14	13	12	12	8	8
53	14	6	10	14	14	12	10	10

	Adj 2	Adj 3	Adj 4	Adj 5	Adj 6	Adj 7	Adj 8	Adj 9
54	8	6	12	14	14	15	12	12
55	6	6	4	12	12	10	10	10
56	14	8	15	18	14	14	14	12
57	6	4	18	8	10	10	8	6
58	8	8	13	12	12	10	8	8
59	4	3	3	3	6	6	6	10
60	16	4	12	10	16	18	7	10
61	3	3	8	16	9	8	6	6
62	3	5	5	4	9	6	6	6
63	3	3	3	3	7	6	6	6
64	1	1	4	4	6	6	4	4
65	3	2	3	6	7	6	4	6
66	8	4	8	14	14	10	8	8
67	4	1	10	6	12	8	6	10
68	8	6	10	12	12	16	12	12
69	3	3	7	8	8	8	6	6
70	2	2	12	10	9	10	4	6
71	2	2	2	3	6	8	4	6
72	3	2	8	8	12	8	6	8
73	6	3	9	10	10	10	6	8
74	8	6	9	14	12	14	12	12
75	2	2	3	3	7	6	6	6
76	12	6	20	13	20	16	12	12
77	3	2	6	4	9	10	6	6
78	6	4	8	10	10	10	8	8
79	8	6	7	12	12	14	12	12
80	3	4	7	6	10	8	6	6
81	3	4	3	3	9	8	6	6
82	2	2	4	4	8	8	4	4

	Mean estimates (9)	Mean estimates (3)	LOA wks	ARR
1	15	12	13	1.08
2	5	4	15	3.75
3	7	9	7	.78
4	7	9	7	.78
5	7	4	9	2.25
6	5	6	16	2.67
7	7	8	5	.62
8	7	5	4	.80
9	5	7	3	.43
10	4	3	6	2.00
11	6	7	9	1.29
12	11	13	8	.62
13	3	3	4	1.33
14	9	10	8	.80
15	5	4	5	1.25
16	3	2	5	2.50
17	6	6	4	.67
18	11	14	19	1.36
19	11	12	16	1.33
20	5	7	6	.86
21	6	6	3	.50
22	6	5	4	.80
23	6	5	5	1.00
24	8	7	12	1.71
25	6	6	10	1.67
26	3	3	4	1.33
27	5	5	10	2.00
28	10	12	12	1.00
29	5	4	17	4.25
30	5	4	7	1.75
31	4	4	8	2.00
32	11	13	26	2.00
33	7	5	8	1.60
34	7	10	11	1.10
35	4	3	4	1.33
36	7	10	8	.80
37	9	7	4	.57
38	11	12	22	1.83
39	8	5	13	2.60
40	4	3	2	.67
41	8	9	9	1.00
42	5	4	9	2.25
43	5	7	13	1.86
44	8	8	13	1.62
45	7	6	6	1.00
46	5	4	5	1.25
47	5	4	8	2.00
48	10	12	7	.58
49	4	4	7	1.75
50	5	6	17	2.83
51	5	5	8	1.60
52	10	12	14	1.17
53	11	11	11	1.00

	Mean estimates (9)	Mean estimates (3)	LOA wks	ARR
54	11	13	7	.54
55	8	9	15	1.67
56	13	15	26	1.73
57	8	11	19	1.73
58	9	11	20	1.82
59	5	5	7	1.40
60	11	11	18	1.64
61	7	10	13	1.30
62	6	5	5	1.00
63	5	4	7	1.75
64	4	4	6	1.50
65	5	5	6	1.20
66	9	10	7	.70
67	7	9	17	1.89
68	10	11	9	.82
69	6	7	7	1.00
70	7	9	13	1.44
71	4	4	17	4.25
72	7	8	13	1.62
73	8	9	8	.89
74	10	12	12	1.00
75	4	4	10	2.50
76	13	15	6	.40
77	6	5	12	2.40
78	8	9	16	1.78
79	10	10	9	.90
80	6	6	6	1.00
81	5	4	8	2.00
82	4	4	8	2.00

Multiple regression analysis first prospective study

Multiple Regression Y_1:ARR 11 X variables

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
81	.508	.258	.141	.751

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	11	13.716	1.247	2.213
RESIDUAL	70	39.447	.564	p = .023
TOTAL	81	53.163		

No Residual Statistics Computed

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	1.208				
Illness history	.016	.004	.465	4.019	.0001
Injury history	-.005	.003	-.193	1.772	.0807
Depression	-.096	.043	-.329	2.238	.0284
Anxiety	.061	.036	.254	1.671	.0991
GHQ 12	-.013	.026	-.07	.523	.6027
Life events	.275	.216	.144	1.269	.2085

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
Work social su...	.043	.038	.126	1.125	.2645
Work satisfacti..	-.022	.037	-.067	.597	.5523
Service	-3.833E-5	3.951E-5	-.108	.97	.3354
Culpability	-.03	.031	-.154	.949	.3458
Causal respons...	.044	.029	.246	1.526	.1315

Multiple regression analysis first prospective study

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
INTERCEPT					
Illness history	.008	.023	.009	.022	16.152
Injury history	-.011	.001	-.01	-3.078E-4	3.141
Depression	-.182	-.01	-.168	-.025	5.009
Anxiety	-.012	.133	1.605E-4	.121	2.794
GHQ 12	-.065	.038	-.057	.03	.273
Life events	-.157	.706	-.086	.635	1.612

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
Work social su...	-.033	.12	-.021	.107	1.265
Work satisfacti..	-.096	.052	-.084	.04	.357
Service	-1.171E-4	4.049E-5	-1.042E-4	2.754E-5	.941
Culpability	-.092	.033	-.082	.023	.901
Causal respons...	-.014	.102	-.004	.093	2.329

The multivariate approach to statistical analysis. Simple correlations between pairs of variables provide only part of the relational information since they are calculated independently of all the other variables. In a study of this sort in which the influences on the behaviour of interest are probably the result of many different factors, these factors must be considered together. Multiple regression analysis can simultaneously analyse all the variables, by generating a mathematical equation representing the relationship of these variables to the outcome variable. This is a mathematical modelling of the relationships in the data. Although the main objective of multiple regression is often used to determine whether the independent variables are important predictors of the dependent variable, the technique can also be used to summarise data and study relationships among variables. Some variables which are not significantly related to the outcome variable by simple correlation may, nevertheless be important due to interaction with other variables. This is what one would expect in studying a phenomenon which is most likely influenced by a very wide range of factors.

The ease with which statistical analyses can be carried out using the powerful programs which are now available on PCs necessarily has had an effect on the approach a researcher can take to the investigation of the data. Many more combinations of variables can be included; and many more multiple regression models can be tested than would be possible without computer assistance. This allows a better insight into the relationships between variables which can lead to the development of better models. This approach is particularly useful when dealing with the complex relationships which exist between social and psychological variables, and is now considered acceptable in statistical modelling.

Generally, the more variables which are included, the greater the explanatory power of the equation but a balance needs to be achieved between the number of variables and the sample size in order to avoid spurious accuracy and develop a model capable of interpretation. To clarify the underlying relationships

between the variables, and to enable the 'best' set of variables to be selected some additional statistical techniques should be applied within the multiple regression analysis. In particular by applying the stepwise analysis procedure, only those variables which make a significant 'improvement' are included, according to an *a priori* limit of statistical significance. In this case, when testing the *F* value of a variable, a level of significance of less than or equal to .05 is used as the criterion for inclusion, and a level of significance greater than or equal to .10 as the criterion for elimination. In computing the combined contribution of the variables, others which do not fit this criterion of significance are excluded and those which do are included in a sequential, stepwise manner. Mathematically, the calculation proceeds as follows: To start the process, the variable with the highest calculated *F* value is entered provided that the statistical probability associated with this *F* value is less than or equal to .05. *F* values are then re-calculated and, again, the variable with the next highest *F* value, provided that it meets the criterion, is entered. At each stage all the variables currently in the equation are tested and any for which the *F* value is less than the value required to achieve significance of .10, are then removed from the equation. This process continues until no further variables meet the criterion for inclusion or exclusion. The package used, *Statview Macintosh ©*, controlled inclusion and exclusion using values of the *F* statistic rather than their associated probability levels, and the appropriate critical values of *F* had to be determined by reference to tables before the package could be used. This procedure also orders the contribution of the variables according to their importance. (To be completely correct, this description of the stepwise regression although accurate in statistical terms may not reflect the internal operation of *Statview Macintosh* as the stepwise procedure can be effected in more than one way)

Once this mathematical procedure has been carried out, the next problem is how to make sense of and interpret the predictive equation. Within the constraints of the range of variables which have been tested in any study, that equation which

produces the largest *adjusted* R_2 with a reasonable number of predictors is considered to be the 'best set'. As the stepwise inclusion and elimination proceeds, the *adjusted* R_2 along with the R_2 becomes larger, but with decreasing increments. The relationships between these data can be modelled using a combination of a priori and theory driven models, as well as those models generated by the mathematical relationships calculated by the program. The aim is to find that model which is most 'concise' and 'parsimonious' model to use the terms of Nie et al. (1988). The size of the increment is indicative of the statistical importance of that additional variable and, particularly if the variables do not make sense according to theory, or if they add little to the variance, it is reasonable to exclude some.

In interpreting these equations a balance can be struck between scientific rigour on the one hand, and the practical application of the findings on the other. Awareness of the personal and social characteristics of officers which relate to a longer or shorter recovery can assist the officers' own preventative health strategies, and guide the Medical Department in planning early intervention. Some factors which may not show a strong statistical relationship with the outcome may, nevertheless, be important in individual cases or in interaction with certain other factors. The fact of a significant loss of explanatory power when the more peripheral variables were excluded by the stepwise analysis, suggests that they were indeed contributory to explaining variation in recovery time. In terms of scientific rigour, only those variables which reach the a priori criterion of significance ($p = <.05$) are considered, but a more realistic or practical picture may include consideration of all the factors that bear some relationship, producing a constellation of relevant patient characteristics. Consideration of these would be a preliminary step towards identifying vulnerability in accident victims. Analysis of factors relevant to recovery after off duty injuries should, however, be presented before these points and the findings can be discussed further.

Multiple regression analysis first prospective study: on duty injury sample

Multiple Regression Y_1:ARR 11 X variables

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
42	.725	.526	.358	.469

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	11	7.565	.688	3.127
RESIDUAL	31	6.818	.22	p = .0061
TOTAL	42	14.383		

No Residual Statistics Computed

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	.52				
Illness history	.008	.003	.363	2.525	.0169
Injury history	-.003	.003	-.141	.981	.3341
Depression	-.115	.035	-.626	3.309	.0024
Anxiety	.031	.029	.203	1.07	.2931
GHQ 12	.017	.025	.126	.694	.4927
Life events	.505	.224	.355	2.252	.0315

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
Work social su...	.084	.034	.352	2.45	.0201
Work satisfacti..	.004	.034	.018	.132	.896
Service	-7.823E-5	3.980E-5	-.269	1.966	.0584
Culpability	-.088	.04	-.402	2.192	.036
Causal respons...	.049	.027	.345	1.812	.0797

Multiple regression analysis first prospective study: on duty injury sample

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
INTERCEPT					
Illness history	.002	.015	.003	.014	6.378
Injury history	-.009	.003	-.008	.002	.963
Depression	-.186	-.044	-.174	-.056	10.95
Anxiety	-.028	.09	-.018	.08	1.144
GHQ 12	-.033	.067	-.025	.059	.482
Life events	.048	.963	.125	.886	5.073

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
Work social su...	.014	.154	.026	.143	6.002
Work satisfacti..	-.064	.073	-.053	.062	.017
Service	-1.594E-4	2.949E-6	-1.457E-4	-1.074E-5	3.864
Culpability	-.17	-.006	-.156	-.02	4.805
Causal respons...	-.006	.104	.003	.095	3.283

Stepwise regression analysis first prospective study: on duty injury sample

Stepwise Regression Y_1:ARR 11 X variables

Summary Information

F to Enter	2.61
F to Remove	2.2
Number of Steps	4
Variables Entered	4
Variables Forced	

No Residual Statistics Computed

Stepwise Regression Y_1:ARR 11 X variables

STEP NO. 1 VARIABLE ENTERED: X_{10}: Culpability

R:	R-squared:	Adj. R-squared:	Std. Error:
.282	.079	.057	.568

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	1.141	1.141	3.534
RESIDUAL	41	13.242	.323	
TOTAL	42	14.383		

STEP NO. 1 Stepwise Regression Y_1:ARR 11 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	1.723			
Culpability	-.062	.033	-.282	3.534

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	.105	.443
Injury history	-.133	.718
Depression	-.267	3.072
Anxiety	-.035	.05
GHQ 12	-.036	.052

Stepwise regression analysis first prospective study: on duty injury sample

STEP NO. 1 Stepwise Regression Y_1:ARR 11 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Life events	.174	1.244
Work social su...	.238	2.394
Work satisfacti..	.001	7.628E-5
Service	-.24	2.438
Causal respons...	.18	1.339

Stepwise Regression Y_1:ARR 11 X variables

STEP NO. 2 VARIABLE ENTERED: X_3: Depression

R:	R-squared:	Adj. R-squared:	Std. Error:
.381	.145	.102	.554

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	2	2.086	1.043	3.392
RESIDUAL	40	12.297	.307	
TOTAL	42	14.383		

STEP NO. 2 Stepwise Regression Y_1:ARR 11 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	1.861			
Depression	-.047	.027	-.256	3.072
Culpability	-.06	.032	-.275	3.541

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	.131	.686
Injury history	-.07	.195
Anxiety	.213	1.847
GHQ 12	.175	1.235

Stepwise regression analysis first prospective study: on duty injury sample

STEP NO. 2 Stepwise Regression Y_1:ARR 11 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Life events	.336	4.962
Work social su...	.215	1.887
Work satisfacti..	-.059	.134
Service	-.279	3.299
Causal respons...	.208	1.76

Stepwise Regression Y_1:ARR 11 X variables

STEP NO. 3 VARIABLE ENTERED: X_6: Life events

R:	R-squared:	Adj. R-squared:	Std. Error:
.491	.242	.183	.529

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	3	3.474	1.158	4.14
RESIDUAL	39	10.909	.28	
TOTAL	42	14.383		

STEP NO. 3 Stepwise Regression Y_1:ARR 11 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	1.801			
Depression	-.075	.029	-.408	6.911
Life events	.494	.222	.347	4.962
Culpability	-.053	.031	-.24	2.932

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	.109	.453
Injury history	-.187	1.371
Anxiety .	.198	1.556

Stepwise regression analysis first prospective study: on duty injury sample

STEP NO. 3 Stepwise Regression Y_1:ARR 11 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
GHQ 12	.17	1.124
Work social su...	.358	5.574
Work satisfacti..	-.014	.008
Service	-.238	2.292
Causal respons...	.154	.928

Stepwise Regression Y_1:ARR 11 X variables

(Last Step) STEP NO. 4 VARIABLE ENTERED: X_7: Work social support

R:	R-squared:	Adj. R-squared:	Std. Error:
.582	.339	.269	.5

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	4	4.87	1.217	4.862
RESIDUAL	38	9.514	.25	
TOTAL	42	14.383		

STEP NO. 4 Stepwise Regression Y_1:ARR 11 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	.81			
Depression	-.077	.027	-.419	8.115
Life events	.657	.221	.462	8.852
Work social su...	.08	.034	.334	5.574
Culpability	-.039	.03	-.178	1.721

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	.186	1.328
Injury history	-.084	.265

Stepwise regression analysis first prospective study: on duty injury sample

STEP NO. 4 Stepwise Regression Y_1:ARR 11 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Anxiety	.202	1.578
GHQ 12	.156	.922
Work satisfacti..	.031	.035
Service	-.216	1.807
Causal respons...	.215	1.787

Appendix AA: Correlation matrix all variables: second prospective study

	Illness h...	Injury hi...	Depressi...	Anxiety	Life Eve...	Job sati...	Service	Culpabili...
Illness hi...	1							
Injury hi...	.484	1						
Depression	-.074	-.065	1					
Anxiety	-.055	-.085	.544	1				
Life Events	.424	.301	.148	.197	1			
Job satis...	-.259	-.204	-.118	-.1	-.237	1		
Service	.168	-.139	-.11	-.155	.057	-.186	1	
Culpability	-.201	-.236	.095	.156	-.194	.179	.204	1
Causal re...	-.061	-.183	.024	.062	.015	.043	.116	.556
SM	-.047	.012	.19	.24	-.021	.198	-.391	-.124
ET	-.107	-.114	.109	-.097	-.178	.203	-.046	.051
MT	-.142	.162	.115	.275	-.023	-.008	-.104	.064
PR	-.214	-.042	-.07	.011	.113	-.102	.375	.06
PF	-.101	-.035	-.047	-.286	-.01	.063	-.022	-.285
Finsolv	-.099	.011	-.083	-.299	-.271	.145	-.142	.067
Mean esti...	-.068	.089	-.047	-.146	.16	.074	.022	.053

	Illness h...	Injury hi...	Depressi...	Anxiety	Life Eve...	Job sati...	Service	Culpabili...
LOA	.162	-.016	-.01	-.073	.155	-.047	.046	-.162
ARR	.234	-.061	.037	.046	.138	-.113	.057	-.213

Appendix AA: Correlation matrix all variables: second prospective study

	Causal r...	SM	ET	MT	RR	PF	Finsolv	Mean es...
Causal re...	1							
SM	-.212	1						
ET	-.184	.175	1					
MT	-.204	.434	.189	1				
RR	.055	-.339	-.054	.076	1			
PF	-.131	.193	.28	.05	-.022	1		
Finsolv	-.089	-.169	-.022	-.064	-.148	-.017	1	
Mean esti...	.117	-.151	-.062	.005	.053	.267	.058	1

	Causal r...	SM	ET	MT	RR	PF	Finsolv	Mean es...
LOA	-.196	-.156	.064	-.082	-.127	-.107	.047	.476
ARR	-.304	-.079	.079	-.07	-.129	-.281	-.048	-.142

	LOA	ARR
LOA	1	
ARR	.772	1

Correlation matrix second prospective study: on duty injury sample

Correlation Matrix for Variables: X_1 ... X_{11}

	Illness h...	Injury hi...	Anxiety	Depressi...	LE dummy	Service	Culpabili...	Causal r...
Illness hi...	1							
Injury hi...	.179	1						
Anxiety	.324	.307	1					
Depression	-.327	.032	.263	1				
LE dummy	.227	.223	.474	-.072	1			
Service	-.108	-.163	-.101	.197	.029	1		
Culpability	-.439	-.426	-.391	-.264	-.055	.139	1	
Causal re...	-.248	-.108	-.039	.069	.307	.163	.563	1
Mean esti...	-.182	.16	-.278	-.135	.093	-.14	.217	.497
LOA	.484	.05	.19	.053	.106	-.363	-.536	-.002
ARR	.559	-.037	.435	.158	.156	-.261	-.582	-.238

Correlation Matrix for Variables: X_1 ... X_{11}

	Mean es...	LOA	ARR
Mean estima...	1		
LOA	.297	1	
ARR	-.351	.755	1

Correlation matrix second prospective study: off duty injury sample

Correlation Matrix for Variables: X_1 ... X_{11}

	Illness h...	Injury hi...	Anxiety	Depressi...	LE dummy	Service	Culpabili...	Causal r...
Illness hi...	1							
Injury hi...	.673	1						
Anxiety	-.144	-.183	1					
Depression	-4.98E-4	-.041	.545	1				
LE dummy	.53	.351	.151	.274	1			
Service	.283	-.11	-.217	-.235	.082	1		
Culpability	-.169	-.149	.095	.005	-.235	.211	1	
Causal re...	.042	-.127	-.138	-.222	-.101	.054	.456	1
Mean esti...	-.021	.006	-.067	.026	.195	.124	.093	.022
LOA	-.001	-.188	-.007	.136	.163	.329	.115	-.021
ARR	.023	-.236	.06	.183	.092	.384	.076	-.094

Correlation Matrix for Variables: X_1 ... X_{11}

	Mean es...	LOA	ARR
Mean estima...	1		
LOA	.589	1	
ARR	-.047	.749	1

Correlation matrix second prospective study: on duty injury sample

Correlation Matrix for Variables: X_1 ... X_{11}

	Illness h...	Injury hi...	Anxiety	Depressi...	LE dummy	Service	Culpabili...	Causal r...
Illness hi...	1							
Injury hi...	.179	1						
Anxiety	.324	.307	1					
Depression	-.327	.032	.263	1				
LE dummy	.227	.223	.474	-.072	1			
Service	-.108	-.163	-.101	.197	.029	1		
Culpability	-.439	-.426	-.391	-.264	-.055	.139	1	
Causal re...	-.248	-.108	-.039	.069	.307	.163	.563	1
Mean esti...	-.182	.16	-.278	-.135	.093	-.14	.217	.497
LOA	.484	.05	.19	.053	.106	-.363	-.536	-.002
ARR	.559	-.037	.435	.158	.156	-.261	-.582	-.238

Correlation Matrix for Variables: X_1 ... X_{11}

	Mean es...	LOA	ARR
Mean estima...	1		
LOA	.297	1	
ARR	-.351	.755	1

Stepwise regression second prospective study: on duty injury sample

Stepwise Regression Y_1:ARR 8 X variables

Summary Information

F to Enter	2.93
F to Remove	2.75
Number of Steps	3
Variables Entered	3
Variables Forced	0...0

No Residual Statistics Computed

Stepwise Regression Y_1:ARR 8 X variables

STEP NO. 1 VARIABLE ENTERED: X_7: Culpability

R:	R-squared:	Adj. R-squared:	Std. Error:
.582	.339	.297	.713

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	4.165	4.165	8.188
RESIDUAL	16	8.138	.509	
TOTAL	17	12.302		

STEP NO. 1 Stepwise Regression Y_1:ARR 8 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	2.988			
Culpability	-.268	.094	-.582	8.188

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	.416	3.141
Injury history	-.388	2.652
Anxiety	.277	1.245
Depression	.006	4.618E-4
LE dummy	.152	.354

Stepwise regression second prospective study: on duty injury sample

STEP NO. 1 Stepwise Regression Y_1:ARR 8 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Service	-.224	.794
Causal respons...	.133	.271

Stepwise Regression Y_1:ARR 8 X variables

STEP NO. 2 VARIABLE ENTERED: X_1: Illness history

R:	R-squared:	Adj. R-squared:	Std. Error:
.673	.453	.38	.67

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	2	5.573	2.787	6.212
RESIDUAL	15	6.729	.449	
TOTAL	17	12.302		

STEP NO. 2 Stepwise Regression Y_1:ARR 8 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	2.201			
Illness history	.014	.008	.377	3.141
Culpability	-.192	.098	-.417	3.845

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Injury history	-.422	3.034
Anxiety	.224	.739
Depression	.279	1.182
LE dummy	.065	.06

Stepwise regression second prospective study: on duty injury sample

STEP NO. 2 Stepwise Regression Y_1:ARR 8 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Service	-.223	.73
Causal respons...	.147	.31

Stepwise Regression Y_1:ARR 8 X variables

(Last Step) STEP NO. 3 VARIABLE ENTERED: X_2: Injury history

R:	R-squared:	Adj. R-squared:	Std. Error:
.742	.55	.454	.629

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	3	6.772	2.257	5.714
RESIDUAL	14	5.53	.395	
TOTAL	17	12.302		

STEP NO. 3 Stepwise Regression Y_1:ARR 8 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	2.83			
Illness history	.014	.007	.373	3.505
Injury history	-.009	.005	-.345	3.034
Culpability	-.261	.1	-.565	6.792

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Anxiety	.333	1.619
Depression	.257	.916
LE dummy	.183	.452

Stepwise regression second prospective study: on duty injury sample

STEP NO. 3 Stepwise Regression Y_1:ARR 8 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Service	-.302	1.304
Causal respons...	.248	.854

Stepwise regression analysis second prospective study: off duty injury sample

Stepwise Regression Y_1:ARR 8 X variables

Summary Information

F to Enter	4.17
F to Remove	3.5
Number of Steps	1
Variables Entered	1
Variables Forced	0...0

No Residual Statistics Computed

Stepwise Regression Y_1:ARR 8 X variables

(Last Step) STEP NO. 1 VARIABLE ENTERED: X_6: Service

R:	R-squared:	Adj. R-squared:	Std. Error:
.384	.147	.121	.464

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	1.191	1.191	5.522
RESIDUAL	32	6.904	.216	
TOTAL	33	8.095		

STEP NO. 1 Stepwise Regression Y_1:ARR 8 X variables

Variables in Equation

Parameter:	Value:	Std. Err.:	Std. Value:	F to Remove:
INTERCEPT	.626			
Service	7.956E-5	3.386E-5	.384	5.522

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Illness history	-.096	.289
Injury history	-.211	1.447
Anxiety	.158	.797
Depression	.305	3.171
LE dummy	.066	.135

Stepwise regression analysis second prospective study: off duty injury sample

STEP NO. 1 Stepwise Regression Y_1:ARR 8 X variables

Variables Not in Equation

Parameter:	Par. Corr:	F to Enter:
Culpability	-.005	.001
Causal respons...	-.124	.487

	ID	Name	Adj 1	Adj 2	Adj 3	Adj 4
1	1	Extensive bruising right elbow	3	6	4	3
2	2	Puncture wound in thigh	4	6	4	4
3	3	Fractured os calcis	14	22	12	24
4	4	Fractured fibula	12	10	10	12
5	5	Flake fracture of ankle	8	8	8	8
6	6	Fractured collar bone	8	10	6	6
7	7	Ligament strain ankle	3	6	4	4
8	8	Fractured proximal phalanx of right 5th finger	1	6	4	6
9	9	Fractured right metacarpal	2	6	6	8
10	10	Fractured 2nd right metacarpa	2	8	6	6
11	11	Laceration of nerve between thumb and forefinger	8	10	4	8
12	12	Fractured shaft of fibula	12	10	10	12
13	13	Fractured lateral malleolus	8	10	10	12
14	14	Amputation of tip of right ring finge	4	8	6	6
15	15	Severed extensor tendon right middle finger	5	10	6	8
16	16	Torn interosseus muscles of foot	14	14	12	12
17	17	Fractured shaft of left radius	12	10	8	12
18	19	Fractured right scaphoid	12	16	12	16
19	20	Fractured lateral malleolus	10	10	10	12
20	21	Torn ligaments and cartilage in knee	12	16	8	8
21	22	Surgery to remove cartilage in knee after torn cartilage	12	14	10	6
22	23	Spiral fracture of fibula	14	10	8	12
23	24	Torn ligaments in ankle	3	6	6	6
24	25	Pulled deltoid muscle in shoulder and upper right arm	6	8	6	4
25	26	Whiplash	3	12	8	8
26	27	Fractured distal end of humerus	11	10	12	8
27	28	Fractured mid shaft of fibula	14	10	10	8
28	29	Dislocated right thumb, damaged tendons	8	10	6	4
29	30	Fractured head of 5th metatarsal and phalanx in second toe	3	8	6	4
30	31	Ligament strain of ankle	2	6	4	4
31	32	Fractured 5th metatarsal	2	8	6	4
32	33	Acromio-clavicular subluxation (left)	6	8	6	2
33	34	Ligament strain to ankle	5	6	4	4
34	35	Chest bruising Sprained ankle	3	8	4	6
35	36	Crack of humerus Nerve compressed	8	10	10	4
36	37	Effusion of knee	4	6	4	2
37	38	Effusion of knee, torn cartilage	16	12	8	8
38	39	Fractured three fingers in left hand	3	8	6	8
39	41	Fractured right ulna	12	8	8	6
40	42	Avulsion extensor tendon finger	3	6	8	8
41	43	Fractured left olecranon	10	6	8	4
42	44	Fractured left proximal phalanx	2	6	6	4
43	46	Crack of left scaphoid	10	14	10	12
44	47	Bimalleolar Pott's fracture	20	16	10	24
45	48	Tenosynovitis abductor tendon of right wrist and thumb	10	4	6	4
46	49	Haematoma calf muscle Swollen knee joint and wrist	6	12	8	4
47	50	Chip fracture to head of 5th metatarsal	3	8	6	4
48	51	Strained ligaments in knee joint	5	10	4	6
49	52	Fractured right 5th metacarpal	3	6	6	6
50	53	Fractured os calcis Fractured talus	16	24	12	16
51	54	Strain of medial ligament in knee	12	12	6	6
52	55	Inflammation elbow joint	8	4	4	4

	Adj 5	Adj 6	Adj 7	Adj 8	Adj 9	Adj 10	Adj 11	Adj 12	Adj 13	Adj 14	Examiner
1	6	7	10	10	3	2	2	2	4	4	3
2	4	15	4	8	2	3	1	2	4	3	10
3	18	18	10	10	12	8	16	16	16	6	8
4	10	10	10	10	12	8	8	4	8	12	6
5	16	15	10	12	12	4	4	4	8	8	10
6	8	8	6	8	12	6	6	6	8	8	7
7	8	8	6	10	12	3	3	2	8	4	6
8	6	4	4	4	6	3	6	2	5	6	4
9	6	6	6	6	8	3	8	4	8	7	6
10	8	8	6	6	8	3	10	4	8	8	6
11	8	20	10	12	4	4	3	2	3	16	4
12	8	8	8	8	12	8	8	4	8	12	6
13	7	10	10	12	12	6	6	6	8	10	8
14	6	5	4	4	8	4	4	3	10	7	•
15	5	10	6	12	10	6	6	6	10	4	•
16	8	16	10	16	24	6	12	8	8	20	12
17	10	14	10	12	12	6	10	6	8	10	8
18	7	25	12	16	12	8	8	8	12	14	9
19	8	12	10	12	12	6	6	6	8	10	8
20	12	12	10	10	24	4	8	4	16	10	•
21	6	6	6	6	24	4	8	12	8	12	6
22	6	9	8	10	12	8	8	4	8	12	8
23	5	6	6	6	12	3	3	2	6	10	•
24	8	12	8	12	10	3	2	4	6	6	4
25	10	10	8	10	12	3	3	6	4	8	6
26	10	10	8	8	16	8	12	8	12	12	4
27	8	10	8	10	12	8	8	4	6	10	9
28	6	12	4	6	8	3	4	2	16	7	6
29	8	8	5	5	12	4	6	4	6	14	6
30	6	5	6	6	12	3	3	2	8	4	6
31	6	8	4	6	12	4	6	4	6	8	8
32	7	12	4	6	8	3	4	4	4	10	2
33	6	6	6	6	12	3	3	2	6	6	4
34	7	6	6	6	8	3	3	2	6	6	•
35	4	6	4	4	4	6	6	6	6	9	•
36	5	7	4	6	8	2	3	2	6	4	5
37	9	14	6	6	24	3	8	4	2	12	•
38	9	9	6	6	12	4	6	5	2	10	4
39	8	16	6	14	12	6	8	6	8	8	6
40	7	7	6	10	8	4	4	4	8	12	12
41	8	10	6	8	24	4	8	12	12	12	6
42	7	7	6	6	6	3	4	2	6	8	3
43	8	7	12	6	12	8	6	8	16	10	5
44	10	10	10	10	24	8	16	16	12	14	10
45	8	10	4	8	8	2	12	2	6	3	6
46	7	7	6	6	8	2	4	2	6	6	6
47	6	7	6	8	12	3	6	2	6	4	4
48	8	8	4	6	12	3	4	3	8	6	4
49	5	5	6	6	8	3	4	2	6	8	6
50	15	18	12	16	24	8	16	16	16	6	10
51	8	16	8	8	24	3	4	2	8	6	5
52	4	6	4	6	24	2	2	2	6	3	8

	Mean estimates (14)	Mean estimates (3)	LOA weeks	ARR
1	5	7	5	.71
2	5	9	13	1.44
3	14	17	16	.91
4	10	11	5	.46
5	9	12	12	.99
6	8	7	8	1.09
7	6	7	8	1.09
8	4	5	5	1.04
9	6	7	7	1.01
10	6	7	24	3.56
11	8	13	9	.70
12	9	9	6	.67
13	9	11	14	1.20
14	6	5	5	1.06
15	7	10	12	1.21
16	13	15	20	1.37
17	10	13	12	.97
18	13	19	18	.93
19	9	12	12	1.01
20	11	10	5	.47
21	10	6	6	1.02
22	9	10	13	1.24
23	6	6	6	1.07
24	7	9	4	.41
25	8	9	10	1.03
26	10	9	6	.73
27	9	9	15	1.61
28	7	7	7	.94
29	7	6	3	.48
30	5	5	8	1.54
31	6	6	13	2.19
32	6	7	2	.26
33	5	5	3	.62
34	5	6	12	2.05
35	6	5	3	.61
36	4	5	4	.71
37	9	9	6	.67
38	7	8	3	.41
39	9	12	22	1.87
40	7	8	22	2.64
41	9	7	5	.62
42	5	6	4	.73
43	10	8	3	.33
44	14	15	13	.86
45	6	7	7	1.01
46	6	6	6	.98
47	6	6	6	.90
48	6	7	12	1.82
49	5	6	5	.96
50	15	17	11	.68
51	9	10	3	.30
52	6	5	17	3.24

STRATHCLYDE POLICE

ANDREW K SLOAN QPM BA
Chief Constable

Police Headquarters
173 Pitt Street
GLASGOW
G2 4JS

12 January 1989

Small group meetings for all Strathclyde personnel involved in the Lockerbie recovery operations are being planned and within the next few weeks you will be asked to attend one of these.

In preparation, please take this questionnaire home with you and complete it as soon as you can. If you were not working at the Lockerbie site but were involved in other operations elsewhere, many of the questions will not apply to you. In that case, please complete pages 2 and 3, and answer any other questions which you feel do apply. Please then return the completed questionnaire (in the sealed envelope) through despatches to this department at Pitt Street. The same questionnaires are being sent to all personnel who were involved.

Police and civilian personnel carried out many different kinds of work at the Lockerbie site. People can react to work of this kind in several different ways. Most workers who have been involved in similar operations in other parts of the world find that sleeping and eating habits are temporarily disturbed; sometimes they behave differently at home or at work or find that some attitudes change, but there may be no unusual reactions. To respond in either way is normal and natural. The purpose of this questionnaire is to assess the general nature of any reactions to the operation by police and civilian personnel and to improve contingency planning and to help me provide any support that may be necessary.

Events of the scale and complexity of the operation at Lockerbie are rare and I believe it is important to know what carrying out this work meant to you. Some of the questions are standard and have been widely used in the past in other situations, and others are specific to the work at Lockerbie.

Please be completely candid in your answers for the data will only then be of any value. You have my absolute assurance that the information you provide will be kept in the strictest confidence within this department. **Data will not be available to any supervisor and nor will the personnel department have any access.** The completed questionnaires will be coded and analysed by an independent statistician. The programme has the support of the Scottish Police Federation and a report of the findings will be available as soon as it is prepared.

Since the long hours and special demands of the work at Lockerbie may have produced particular pressures at home, included with this questionnaire is a separate page that I hope your spouse, parent or other close person living with you will complete.

The meetings and this questionnaire are not intended as a substitute for other medical or welfare contact. You are, of course, welcome to get in touch with this department or your own welfare officer at any time.

Yours sincerely

W D S McLay

Date:

Thinking about how you have felt over the last few days, and *comparing* that with the way you *usually and normally* feel, please read the questions below and mark them according to how you have felt *over the last few days.*

Have you...

.....been able to concentrate on whatever you're doing?
- [] better than usual
- [] same as usual
- [] less than usual
- [] much less than usual

..lost much sleep over worry?
- [] not at all
- [] no more than usual
- [] rather more than usual
- [] much more than usual

....been having restless disturbed nights?
- [] not at all
- [] no more than usual
- [] rather more than usual
- [] much more than usual

...been managing to keep yourself busy and occupied?
- [] more so than usual
- [] same usual
- [] rather less than usual
- [] much less than usual

..been getting out of the house as much as usual (other than work)
- [] more so than usual
- [] same as usual
- [] less than usual
- [] much less than usual

...been over-reacting to things?
- [] not at all
- [] no more than usual
- [] rather more than usual
- [] much more than usual

.been managing as well as most people would in your shoes?
- [] better than most
- [] about the same
- [] rather less well
- [] much less well

.....felt on the whole you were doing things well?
- [] better than usual
- [] about the same
- [] less well than usual
- [] much less well

....been satisfied with the way that you have carried out tasks?
- [] more satisfied than usual
- [] about the same as usual
- [] less satisfied than usual
- [] much less satisfied

....been able to feel warmth and affection for those near you?
- [] more so than usual
- [] about the same as usual
- [] less than usual
- [] much less than usual

...been finding it easy to get on with other people?
- [] better than usual
- [] about the same
- [] less well than usual
- [] much less than usual

...felt that you are playing a useful part in things?
- [] more so than usual
- [] same as usual
- [] less so than usual
- [] much less than usual

...been taking longer over things that you do?
- [] quicker than usual
- [] same as usual
- [] longer than usual
- [] much longer than usual

...spent much time talking socially with people?
- [] more time than usual
- [] about the same as usual
- [] less time than usual
- [] much less than usual

...felt that you are playing a useful part in things?
- [] more so than usual
- [] same as usual
- [] less useful than usual
- [] much less useful than usual

..felt capable of making decisions about things?
- [] more so than usual
- [] same as usual
- [] less so than usual
- [] much less capable

...been slow to 'catch on' to what people are saying?

[] not at all
[] no more than usual
[] slower than usual
[] much slower than usual

...felt constantly under strain?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

..felt that you couldn't overcome your difficulties?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been finding life a struggle all the time?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been able to enjoy your normal day-to-day activities?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

...been getting scared and panicky for no good reason?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...found remembering things difficult?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been able to face up to your problems?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

...found everything getting on top of you?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been feeling unhappy and depressed?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been losing confidence in yourself?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been thinking of yourself as a worthless person?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...felt that life is entirely hopeless?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...been feeling hopeful about your own future?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

...been feeling reasonably happy all things considered?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

...been feeling nervous and strung up all the time?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...felt that life isn't worth living?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

...found that at times you couldn't do anything because your nerves were too bad?

[] not at all
[] no more than usual
[] rather more than usual
[] much more than usual

....been feeling mentally alert and wide awake?

[] more so than usual
[] same as usual
[] less so than usual
[] much less than usual

On what dates were you called for duty at the site?

Please estimate, by adding together all the shifts you carried out, the *total number of hours* you spent at the site, *excluding* travelling time Hours

Please estimate the total number of hours (or part hours) you spent travelling *to* and *from* the site each day

(i) Travel to and from pick up point to and from your own home: Hours

(ii) Travel by personnel carrier to and from the site: Hours

(iii) Any other usual way you travelled to and from the site? Hours

Please mark the boxes on the left to indicate to which duties you personally were detailed. Please then estimate as accurately as possible what *percentage of the total time you were there* were spent by you at each type of duty (e.g. 100% would be written in the right hand column if all your time was spent at one duty, 50% would be written beside two duties if your time was spent equally between these two duties)

	Duty	Percentage of Time
[]	Search for bodies and evidence (by any method)	
[]	Mortuary duties	
[]	Road patrol, traffic control, motor cycle escort, security patrol	
[]	Administration	
[]	Official dealings with relatives and other members of the public	
[]	Other: Please specify	

How much do you (presently) think about the work that you carried out at the site?

[] don't think about it at all

[] occasionally think about it

[] only think about it when people ask

[] think about it quite often

[] can't stop thinking about it

If you do think about it, is there any particular aspect of the work or of the entire incident that you think about more than other aspects?

In carrying out the work at the site, how important were the following considerations to you personally?

Your own physical well being, health or personal safety.

[] not a consideration
[] a small consideration
[] quite an important consideration
[] an important consideration
[] a very important consideration

Your reputation at work, i.e. the way people, whose opinion you care about, viewed the way you carried out the work.

[] not a consideration
[] a small consideration
[] quite an important consideration
[] an important consideration
[] a very important consideration

Your own self respect in doing a good job.

[] not a consideration
[] a small consideration
[] quite an important consideration
[] an important consideration
[] a very important consideration

There is no reason to expect that you would have experienced any physical complaints while working at the site or afterwards, but have you had any of the following that you attribute to the work you did?

[] upset stomach
[] headache, tightness in the head
[] nausea
[] tightness in chest
[] loss of appetite
[] sleep disturbance (e.g. early waking, difficulty dropping off, bad dreams)
[] other: please specify:
[] some physical complaints, but nothing that you would attribute to working at the site

Are any of these continuing?

[] yes [] no

In difficult or unpleasant situations, people often use different 'strategies', which are ways of looking at a situation or ways of doing things. Please read each item below and indicate, by marking the appropriate category, to what extent you used the strategy, if at all, in carrying out your duties at the site.

Concentrated on what had to be done and got on with it
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Kept my feelings to myself
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Received sympathy or understanding from someone
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Thought of the situation as being character forming.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Tried to make myself feel better by eating/ drinking/ smoking/ taking medication
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Made 'black humour' types of jokes.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Rediscovered or thought about what is important in life
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Didn't let it get to me, refused to think about it too much.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Made light of the situation and refused to get too serious about it.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Talked to someone close to me about how I was feeling.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Drew on past experiences
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Kept my feelings from interfering with other things too much
[] not used
[] used a little
[] used quite a bit
[] used a great deal

Wished that the situation would go away or somehow be over with.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

'Distanced' myself from the most unpleasant aspects of the work by imagining I was working with something else or I was doing something else.
[] not used
[] used a little
[] used quite a bit
[] used a great deal

There is a general assumption that recovery crews require professional or semi-professional supportive counselling. This may or may not be true. While carrying out the work or since then, have you sought or received any professional or lay counselling? (e.g. from your doctor, pastoral counselling, social work department, welfare officers).

[] no [] yes

If yes, how helpful and relevent was it?

[] no help

[] some help

[] very helpful

If no, do you intend to use a resource like this sometime in the near future ?

[] no [] yes

If no, is this because:

[] you don't need it

[] you do not feel that it would have any relevence or be any good

[] you haven't thought about it

Other than the demands that you may have felt as a consequence of the work at the Lockerbie site, *in the past year* have you had any sudden, unpleasant or demanding crises or any continuing worries to deal with at *work*? (e.g. a disciplinary enquiry, an unwanted transfer)

Very briefly, and without going into detail, what was this?

When did it happen?

How much of a crisis or worry was/is this to you?

[] small worry/crisis

[] middling worry/crisis

[] big worry/crisis **Is it resolved now?** [] yes [] no

***In the past year*, have you had any sudden, unpleasant or demanding crises or any continuing worries to deal with at *home* ?** (e.g. a death in the family, a major argument of some sort)

Very briefly, and without going into detail, what was this?

When did it happen?

How much of a crisis or worry was/is this to you?

[] small worry/ crisis

[] middling worry/crisis

[] big worry/crisis **Is it resolved now?** [] yes [] no

The following are some 'open ended' questions. Please feel free to write as little or as much as you want, or to leave this page blank. If you want to write *more* than the space allows please add more sheets of paper.

1. Is there anything that you want to say about carrying out this work: its organisation, the way you felt personally about being assigned to it and carrying it out, or any particular aspects of the work about which you felt particularly good or bad? (e.g. the way you were briefed for it by supervisory officers, difficulties and inconveniences associated with it, other ways in which you think it could have been carried out, whether you accepted this work as part of 'police work', the practical help and leadership and emotional support you received from those giving direction, mutual support or fellowship among the workers, the journeys to and from the site, your personal preparation for work of this kind, relevent previous experiences, satisfaction at a job done well)

2. Are you aware of any change in the way you go about your normal duties or your overall attitude towards your work in the police, your workmates or your supervisors?

3. Are you or were you aware of any changes in the way you are around home?

Multiple regression analysis first prospective study: off duty sample

Multiple Regression Y_1:ARR 11 X variables

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
38	.685	.47	.253	.858

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	11	17.6	1.6	2.173
RESIDUAL	27	19.883	.736	p = .0493
TOTAL	38	37.483		

No Residual Statistics Computed

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	1.978				
Illness history	.035	.008	.825	4.6	.0001
Injury history	-.002	.005	-.057	.361	.7212
Depression	-.087	.094	-.198	.931	.3603
Anxiety	.166	.075	.477	2.206	.036
GHQ 12	-.088	.048	-.362	1.827	.0788
Life events	.31	.354	.138	.876	.389

Multiple Regression Y_1:ARR 11 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
Work social su...	.049	.071	.112	.685	.4993
Work satisfacti..	-.081	.065	-.2	1.234	.228
Service	-8.314E-6	6.237E-5	-.021	.133	.8949
Culpability	-.049	.052	-.191	.928	.3614
Causal respons...	.065	.053	.233	1.238	.2264

Multiple regression analysis first prospective study: off duty sample

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
INTERCEPT					
Illness history	.02	.051	.022	.048	21.162
Injury history	-.012	.008	-.01	.007	.13
Depression	-.28	.105	-.248	.073	.866
Anxiety	.012	.32	.038	.294	4.869
GHQ 12	-.186	.011	-.169	-.006	3.337
Life events	-.416	1.036	-.293	.912	.767

Multiple Regression Y_1:ARR 11 X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
Work social su...	-.097	.195	-.073	.17	.469
Work satisfacti..	-.215	.053	-.192	.031	1.522
Service	-1.363E-4	1.197E-4	-1.146E-4	9.793E-5	.018
Culpability	-.156	.059	-.138	.041	.862
Causal respons...	-.043	.174	-.025	.156	1.533

Simple regression analysis first prospective study: off duty sample

Simple Regression X_1: Illness history Y_1: ARR

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
38	.545	.297	.278	.844

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	11.141	11.141	15.65
RESIDUAL	37	26.341	.712	p = .0003
TOTAL	38	37.483		

No Residual Statistics Computed

Simple Regression X_1: Illness history Y_1: ARR

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	1.128				
SLOPE	.023	.006	.545	3.956	.0003

Confidence Intervals Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:
MEAN (X,Y)	1.343	1.891	1.389	1.845
SLOPE	.011	.035	.013	.033

Correlation matrix first prospective study: on duty injury sample

Correlation Matrix for Variables: X_1 ... X_{14}

	Illness h...	Injury hi...	Depressi...	Anxiety	GHQ 12	Life eve...	Work so...	Work sa...
Illness hi...	1							
Injury hi...	.218	1						
Depression	.081	.252	1					
Anxiety	.026	.225	.686	1				
GHQ 12	-.081	.152	.627	.653	1			
Life events	.112	.353	.435	.356	.304	1		
Work soc...	-.202	-.397	-.123	-.073	-.042	-.313	1	
Work sati...	-.044	.01	-.21	-.286	-.328	-.215	-.05	1
Service	.305	-.028	-.104	-.046	-.159	-.202	-.037	-.063
Culpability	.024	.079	.025	-.05	.034	-.089	-.156	.052
Causal re...	-.17	.126	.071	.053	.071	.087	-.239	.15
Mean esti...	.059	.18	.345	.326	.081	-.001	-.08	.233
LOA	.163	.004	-.015	.21	.006	.113	.192	.218
ARR	.094	-.149	-.263	-.02	-.044	.191	.269	-.013

Correlation Matrix for Variables: X_1 ... X_{14}

	Service	Culpabili...	Causal r...	Mean es...	LOA	ARR
Service	1					
Culpability	.029	1				
Causal respo...	-.065	.689	1			
Mean estima...	.131	-.087	-.019	1		
LOA	-.012	-.268	-.033	.567	1	
ARR	-.238	-.282	-.069	-.382	.462	1

Correlation matrix first prospective study: off duty sample

Correlation Matrix for Variables: X_1 ... X_{14}

	Illness h...	Injury hi...	Depressi...	Anxiety	GHQ 12	Life eve...	Work so...	Work sa...
Illness hi...	1							
Injury hi...	.01	1						
Depression	-.085	-.372	1					
Anxiety	-.299	-.317	.626	1				
GHQ 12	.174	-.003	.176	.314	1			
Life events	.001	-.123	.048	.092	.298	1		
Work soc...	-.034	.07	-.087	-.105	.311	.078	1	
Work sati...	.176	-.057	.031	-.158	-.258	-.046	.014	1
Service	.192	-.123	.179	.187	.114	-.191	.02	.191
Culpability	-.218	-.265	.49	.267	-.068	-.049	.124	-.11
Causal re...	-.382	-.023	.272	.184	-.013	-.129	.033	-.043
Mean esti...	-.144	.001	.113	-.096	.152	.448	.159	.225
LOA	.342	.029	-.043	-.062	.186	.357	.173	.193
ARR	.545	-.075	-.055	.031	.032	.073	-.074	-.038

Correlation Matrix for Variables: X_1 ... X_{14}

	Service	Culpabili...	Causal r...	Mean es...	LOA	ARR
Service	1					
Culpability	.053	1				
Causal respo...	-.13	.545	1			
Mean estima...	-.114	.082	.115	1		
LOA	-.097	-.042	-.015	.453	1	
ARR	.054	-.146	-.149	-.438	.481	1

Letter which accompanied the questionnaire in the cross sectional study.

Department of Psychology
University of Glasgow
62 Hillhead Street
Glasgow G12

Dear Sir or Madam,

I understand that you have recently been injured. Research is currently being carried out through the Department of Psychology at Glasgow University to investigate what convalescence from such injuries is like. I would be very grateful if you would complete the enclosed questionnaire and return in directly to the Department of Psychology in the enclosed stamped addressed envelope.

Please be assured that your answers are anonymous. None of the information will be seen by your employer, nor will it be used for any purpose other than research. The study is being supported by the Scottish Police Federation, if however, you want to find out more about the research or if you have any questions or comments, please leave a message at 339 8855 (extn. 5485) during office hours and I will return your phone call.

It is important that you complete the questionnaire as soon as possible.

Thank you again for your co-operation.

Yours sincerely,

Margaret Mitchell,

Letter sent to officers who could not be contacted by telephone: first prospective study.

Mr ***
*****
*****

Dear Mr ***,

Research for the Scottish Police Federation into injuries sustained by police officers both on and off duty is being carried out by the Psychology Department at Glasgow University with the permission of this department. Since you have recently injured your ****, you may be suitable to take part in the study.

The researcher, **Margaret Mitchell**, can be contacted by telephone through the **Medical Department at Headquarters (041-227 1332)**, every morning and would be grateful if you would phone her so she can explain the research to you in more detail. The purpose of the research is to find out about the types of problems officers may have while recovering from injury and to eventually develop ways of helping officers during their convalescence.

It is not compulsory to take part, but for the study to be successful a high rate of participation is required. If, however, you have already resumed duties by the time you receive this letter there would be no need to telephone. If you have not resumed, please contact the researcher as soon as is convenient.

Thank you.

Letter which accompanied the questionnaire in the first longitudinal study.

Department of Psychology
University of Glasgow
62 Hillhead Street
Glasgow G12

Address

Dear ***,

Thank you for agreeing to take part in this study of injuries in police personnel. The study is being supported by the Scottish Police Federation and its purpose is to find out what problems officers may encounter in recovering from injury. If you want to find out more about the research or if you have any questions or comments, please leave a message at 339 8855 (extn. 5485) during office hours and I will return your phone call.

I hope you enjoy completing the questionnaire which should take you about thirty minutes. The answers that you provide are completely confidential and will only be used only for research purposes, to calculate statistical averages based on all the subjects in the study. The information that you provide will be seen by no-one other than myself at the University, and it will not be seen by your employer.

It is important that you complete the questionnaire immediately and return it in the envelope provided. Most of the questions are about your normal life before you had your injury and only some specifically ask about the injury and how it happened.

Thank you again.

Yours sincerely,

Margaret C. Mitchell,
Research Associate

Introduction to the interview in the second longitudinal study.

Thank you for taking part in this study. As I explained before the purpose of it is to find out if police officers have difficulties recovering from injuries and if anything can be done to help their recovery. Some of the questions in the interview are to do with your home life and I hope that you do not find these questions a great invasion of your privacy. I would like to tape record some parts of the interview but, naturally, would not do so without your permission. The reason for this is that it is important to record peoples' attitudes in their own words. You have my complete assurance that the information you provide and any details of your medical situation are used solely for the purposes of this research and form no part of any record kept by your employer. Mrs Miller asked you / will ask you about any restrictions that the injury has placed on your activities but I would like to find out about your attitudes more generally as well as more about the incident in which you were injured. You might think that this is a tremendous fuss over what may be a relatively minor injury but for the purposes of a controlled study each injured person in the study must be asked the same questions, so you may just have to bear with me. If there are some that you are not clear about, please ask me. Do you have any questions just now? I should mention that sometimes the way the questions are posed might remind you of being in court and being asked questions by lawyers - please don't let that put you off in any way. I may ask the same sort of questions in different ways but this is not to trick you or to check up in some way on your answers but just so I can be sure that I have understood what is your opinion.

First of all, I would like you to answer some questions about what you think of various aspects of your work.